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ORIGINAL COMMUNICATIONS.

A CASE OF CONGENITAL ABSENCE OF BOTH RADII—CASE OF SYPHILITIC DISEASE OF THE SKULL AND BRAIN.

REPORT OF CASES OCCURRING IN THE SERVICE OF PROFESSOR JOHN ASHHURST, JR., HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

BY A. E. TAYLOR, M.D.

Congenital Absence of both Radii.—The subject was three years of age, the child of Poles in whose family existed no history of anomalies of any sort. In each forearm the radius was absent. The forearm was quite short, and markedly bowed, concavity outward. The muscles on the radial aspect were poorly developed. From the wrist-joint the hands were turned outward at an angle of about fifty degrees. The wrist-joint itself was very loose and freely movable, evidently an articulation of little strength, as the ligaments did not hold the ulna tightly to the carpal bones with which the ulna seemed directly to articulate. Pronation and supination were not performed, but the hand could be imperfectly rotated from the shoulder. Flexion and extension were normally free. The hands presented curious anomalies. Upon the left hand there was no thumb, only a tiny cutaneous excrescence, and the first metacarpal bone was likewise absent. Upon the right hand was a maldeveloped thumb, consisting of the two phalanges connected by a rudimentary articulation, the member connected to the hand by skin and fasciæ only, there being no trace of any metacarpo-phalangeal articulation nor of the thumb tendons. Being a useless member, this thumb was amputated. Coördination of the fingers was very imperfectly developed, and prehension was awkwardly performed.

Syphilitic Disease of the Skull and Brain; Treatment by Trephining and the Administration of Large Doses of Iodide of Potassium; Recovery.— The patient was a woman about thirty-five years of age. She gave a history of having suffered from a persistent eruption, and of several miscarriages. The symptoms for the relief of which she entered the hospital had continued for eight months. They consisted of constant excrutiating headache and insomnia. The case had been diagnosed as an intracranial tumor. She described the headache as a boring pain, most severe upon the right side of the head and radiating into the forehead and eyes. There was slight internal strabismus. The general health was fairly good, the thoracic and abdominal viscera presented no evidences of disease. Upon the right side of the head, posterior to the line representing the location of the fissure of Rolando, occupying a position seemingly directly over the gyrus supramarginalis, was a large node, and directly above it and lying parallel to the line for the great longitudinal fissure was a ridge about two inches long. Both were slightly tender on pressure. These nodes were presumably of syphilitic origin, and the patient was placed upon ascending doses of potassium iodide, and morphine was administered to alleviate the pain and to procure sleep. The dose of iodide was rapidly increased until the daily dose was one and a half drachms. After ten days the condition of the patient was in no wise improved, rather worse. The headache was so severe that she was completely distracted, and relief was afforded only by very large doses of morphine.

The removal by trephining of the node, the pressure of which was evidently causing the pain, was suggested, and the proposition was accepted. The flap was made in the usual manner and the largest trephine applied to the site of the node. The bone was very dense and the progress of the instrument was very slow. The skull was three-quarters of an inch thick, and when the circle of bone was removed it was seen that the diploë was entirely obliterated (which was inferred from the absence of hemorrhage during the operation), and the greatly increased density and thickness were evidences of a long continued arteriosclerosis. The opening was enlarged with rongeur forceps. The dura mater was slightly sclerotic, the pulsation of the brain was normal. A Hey's saw was next applied to the above-mentioned ridge, and this was sawn through its entire length. The wound was then dressed, and the patient left the table in very good condition. The day following the operation she still had some headache, but after three or four days it disappeared. The iodide was resumed after the operation and the dose held at one and a half drachms daily. The wound healed promptly, and a fortnight after the operation the patient was discharged, with instructions to continue the iodide, which she has done for months. At the time of her discharge the slight strabismus still remained. After six months the patient has reported herself entirely well, and the strabismus has disappeared.

A CASE OF CONGENITAL DEFICIENCY OF THE FINGERS AND TOES.

BY CLARENCE KING, M.D.,

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NOVEMBER 1, 1890, there was admitted to my care at the Cattaraugus County Hospital a patient with a congenital deficiency of the fingers of both hands and of the toes of both feet. Her history was as follows: Martha H., aged fifty-six, four feet ten inches in height, weight ninety-three pounds, never had any serious sickness; but five years before broke her leg and at the same time dislocated her ankle by dropping a heavy kettle on it. She stated that there had been no deformity or congenital defects among her relatives that she had ever heard of, but could not trace her ancestors back further than her grandparents. She had been told by her parents that her deformity was caused by mental impressions received by her mother when three or four months pregnant with her, and this explanation was received by her friends as a fact beyond dispute. At that time her mother had been left alone at a house some distance from any neighbors, when a tramp suddenly appeared in the doorway and demanded food, frightening her so badly that she fainted. She noticed that this man had no fingers upon his hands, and his singular appearance made such an impression upon her that it was several days before she could banish the thought of this man from her mind. Six months later, when her babe (our patient) was born, it showed the same defective formation of its hands, and in addition total absence of its toes, which defects at this time may be described as follows:

Right Hand.—Apparently only four metacarpal bones are present, one of them being for the thumb. The phalangeal bones of the thumb and the thumb-nail are absent. The first phalanx corresponding to each of the three metacarpal bones for the fingers is present, but there are only two nails, one being for the little finger; the other corresponds to the nails of two fingers united and measuring an inch and a quarter in breadth. These rudimentary digits are slightly flexed so that the palm presents a depression which will hold about half an ounce. The dorsal surface of the hand is covered with smooth skin, but the palmar surface shows deep creases which extend to the centre of the palm proper, thus marking out their rudimentary fingers.

Left Hand.—This hand presents five metacarpal bones, but is very like the right hand. The little finger is much more distinctly developed than on the right hand, and, like the right, has its own finger-nail. The thumb

has a terminal protuberance which is devoid of bony structure, and which lies directly in the palm of the hand beneath the tip of the little finger. The other fingers rest on top and all are united, showing palmar creases as in the right hand. The second nail on this hand is formed by the union of those for the other three fingers, and forms three-quarters of a circle and measures two inches from border to border. The palmar depression is deeper than that of the right hand and will hold over an ounce. (Fig. 1.)

Feet.—Each foot shows entire absence of all signs of toes except a shallow crease which marks where the border of the great toe should be. There are five distinct nails on each foot placed over distal ends of the metatarsal bones. There is also a bony peculiarity in the tarsal bones, the exact nature of which would require a dissection to determine. The patient walks with a marked "hitch" in her gait. (Fig. 2.)

In addition to these deformities, we note that her eyes are widely separated from each other and that the right eye protrudes abnormally and is opened wider habitually than the left. She also has a large nose which is very broad at the tip, but her face is in no other way deformed.

It is remarkable how much work this woman is able to do with her hands in such a crippled condition. She feeds herself, dresses and undresses herself, makes beds, and does all kinds of kitchen work. She can pick up small objects with her right hand, but cannot do so with her left. Of course, to do certain things, as for instance, to pour out tea or carry a lamp, she has to use both hands. Yet she has never had any serious accident from dropping things, except the one mentioned in the first paragraph of this paper.

A STUDY OF CHOLEDOCHOTOMY.

BY WILLIAM S. MAGILL, M.D., and MAURICE JOURDAN, M.D.,

of Paris. of Marseilles.

THE first suggestion of incision of the common duct for the extraction of stone appears to come from Lagenbuch, who writes, in 1884, as follows: "In cases of persistent stenosis of the common duct, by incision of the canal, —most frequently enormously dilated, attaining the volume even of the small intestine,—collecting the bile with sponges, the stone could be extracted, and the incision of the common duct then closed with sutures." In July, of 1885, Parkes, of Chicago, proposed the same intervention. Kümmel, in 1890, published the first operation of choledochotomy, performed six years before, in 1884. The same year Voigt mentions, in his monograph on the surgery of the liver ducts, an operation of choledochotomy done by Heussner. Thornton publishes three cases, operated by choledochotomy,

Fig. 1.

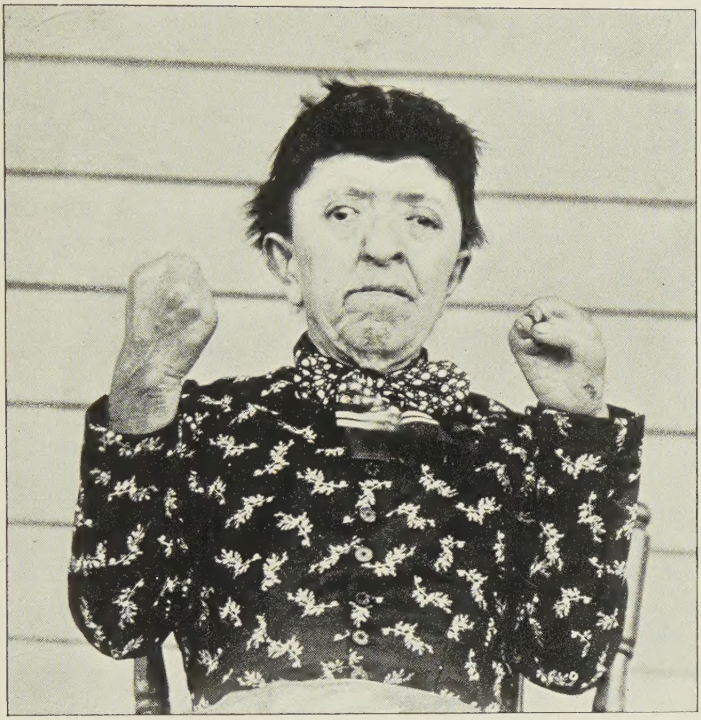
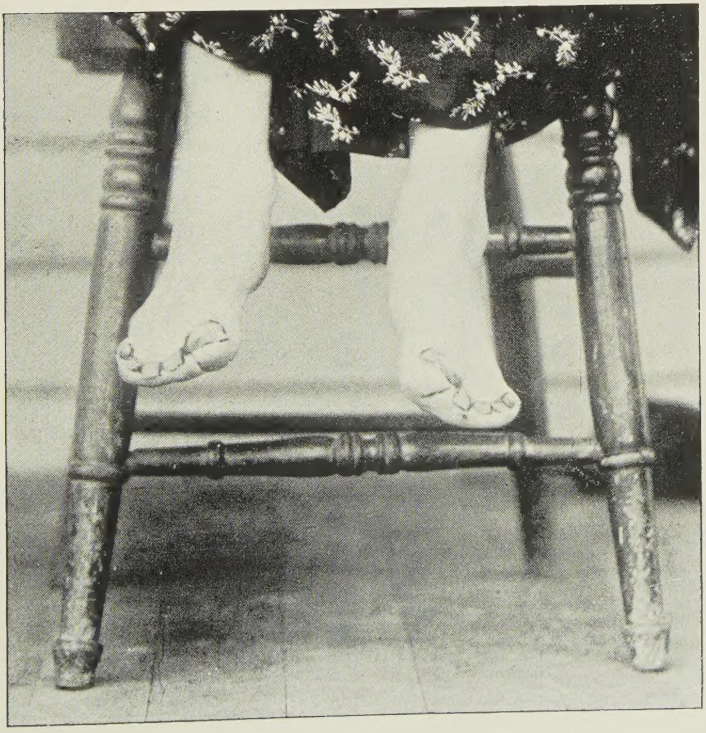


Fig. 2.



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in 1889; and from this time isolated operations are found frequently in the medical publications. The report of Professor Terrier, read at the sixth session of the Congrès français de Chirurgie, included thirteen cases of choledochotomy, and introduced the subject to French surgeons. A little later he published, the first in France, a case of choledochotomy, reviewing at that time (1891) seventeen reports of the same operation.

Since the writing of this monograph we have not found other special studies of the subject than Martig's thesis "Zur Chirurgie des Gallenwege," Bâle, 1893, twenty-seven cases, and the contribution of Lepetit, which adds one more to the nineteen previously reported by Terrier. The Société de Chirurgie de Paris has recently discussed the subject, and in its bulletins will be found the important communications of Michaux, Quénu, Schwartz, and Tuffier. Seven cases of choledochotomy recently performed in France, one in Switzerland, and four in Germany, obligingly communicated to us for publication, added to our bibliographical research, give us a total of seventy-two interventions involving the incision of the common duct.

These seventy-two histories, serving as the basis of our study and the authority of our own conclusions, may best be given here in a chronological table.

A reference to the table on the next page will show the necessity of considering the operation of choledochotomy in various groups of cases.

The total contraction of the gall-bladder so that it is unrecognizable even in the mass of adhesions formed with the under surface of the liver, or the absence of calculi in the bladder, assured by palpation, determines a class of cases in which the only intervention consists in establishing the permeability of the common duct; the operation becomes one of simple choledochotomy.

Sometimes, however, after operating on the common duct, the gall-bladder is opened to remove the stones therein contained, or to verify their absence, and then the open bladder may be excised, definitively closed, and reduced into the abdomen or stitched in the parietal wound. The entire intervention thus becomes a choledochotomy, with cholecystectomy, cholecystotomy, or cholecystostomy, according to the treatment of the open gall-bladder.

Again, choledochotomy may be resorted to as a second intervention, the anterior operation not having relieved the stenosis of the common duct. The usual example of this is found in the creation of a biliary fistula to put an end to the accidents of retention of the gall, caused by a calculous obstruction of the common duct, in which case choledochotomy is subsequently necessary in order to cure the fistula.

The varying conditions and complications of the intervention itself, variable for the different kinds of calculous obstruction, are of great importance in the consideration of results. The distinction is imperative between a primitive choledochotomy and that secondary to a biliary fistula,

No. of Statistical Tables.	Surgeon.	Date of Operation.	Nature of the Intervention.	Recovered.	Died.
26	Kümmel.	Feb. 6, 1884.	Choledochotomy and cholecystectomy.		1
1	Thornton.	May 9, 1889.	Choledochotomy.	1	
46	Thornton.	June 2, 1889.	Choledochotomy and cholecystostomy.	1	
35	Heussner.	June 6, 1889.	Choledochotomy and ideal cholecystotomy.	1	
2	Thornton.	Nov. 28, 1889.	Choledochotomy.	1	
3	Courvoisier.	Jan. 21, 1890.	Choledochotomy.	1	
36	Lloyd.	Jan. 24, 1890.	Choledochotomy and cholecystotomy.		1
37	Courvoisier.	Feb. 18, 1890.	Choledochotomy and ideal cholecystotomy.	1	
69	Courvoisier.	March 23, 1890.	Choledochotomy and cholecystenterostomy secondary to cholecystostomy and choledocholithotripsy.	1	
4	Küster.	June 11, 1890.	Choledochotomy.	1	
56	Hochenegg.	Dec. 21, 1890.	Choledochotomy and cysticotomy.	1	
57	Kehr.	Dec. 28, 1890.	Choledochotomy secondary to cholecystostomy.	1	
5	Van der Veer.	Jan. 15, 1891.	Choledochotomy.		1
27	Rehr.	March 10, 1891.	Choledochotomy and cholecystectomy.	1	
28	Abbe.	April 13, 1891.	Choledochotomy; cholecystectomy.	1	
6	Braun.	April, (?) 1891.	Choledochotomy.	1	
7	Frank.	May 27, 1891.	Choledochotomy.	1	
58	Riedel.	May 28, 1891.	Choledochotomy secondary to cholecystostomy.	1	
29	Roux.	June 16, 1891.	Choledochotomy and cholecystectomy.	1	
8	Jaboulay.	June, (?) 1891.	Choledochotomy.		1
47	Riedel.	July 18, 1891.	Choledochotomy and cholecystostomy.	1	
59	Kehr.	July 28, 1891.	Choledochotomy secondary to cholecystostomy.	1	
43	Küster.	July 30, 1891.	Choledochotomy and ideal cholecystotomy.	1	
48	Sutton.	Sept. 18, 1891.	Choledochotomy and cholecystostomy.	1	
49	Riedel.	Oct. 2, 1891.	Choledochotomy and cholecystostomy.	1	
9	Riedel.	Oct. 15, 1891.	Choledochotomy.	1	
50	Riedel.	Dec. 12, 1891.	Choledochotomy and cholecystostomy.		1
60	Kehr.	April 18, 1892.	Choledochotomy secondary to cholecystostomy.		1
10	Terrier.	April 19, 1892.	Choledochotomy.		1
51	Lauenstein.	June 2, 1892.	Choledochotomy.	1	
30	Studsgaard.	June 3, 1892.	Choledochotomy and cholecystectomy.	1	
11	Socin.	July 9, 1892.	Choledochotomy.	1	
31	Kehr.	Oct. 12, 1892.	Choledochotomy and cholecystectomy.	1	
12	Duncan.	Oct., (?) 1892.	Choledochotomy.	1	
14	Lane.	Dec. 8, 1892.	Choledochotomy.		1
13	Doyen.	(?) 1892.	Choledochotomy and choledochorrhaphy.		1
15	Kehr.	Jan. 19, 1893.	Choledochotomy.		1
67	Robson.	Jan. 28, 1893.	Choledochotomy secondary to cystico-colostomy.		1
70	Kehr.	Feb. 4, 1893.	Choledochotomy secondary to choledochotomy and cholecystectomy.	1	
44	Anderson.	Feb. 25, 1893.	Choledochotomy and ideal cholecystotomy.	1	
16	Billroth.	Feb., (?) 1893.	Choledochotomy (choledochostomy).		1
17	Lauenstein.	March 16, 1893.	Choledochotomy.	1	
61	Kehr.	April 27, 1893.	Choledochotomy secondary to cholecystostomy.	1	
18	Jaboulay.	April, (?) 1893.	Choledochotomy.		1
52	Körte.	April, (?) 1893.	Choledochotomy and cholecystostomy.	1	
62	Elliott.	May 22, 1893.	Choledochotomy secondary to cholecystostomy.	1	
45	Czerny.	July 11, 1893.	Choledochotomy and cholecystotomy.		1
53	Lauenstein.	July 30, 1893.	Choledochotomy and cholecystostomy.		1
38	Czerny.	August 1, 1893.	Choledochotomy and ideal cholecystotomy.	1	
39	Jaboulay.	August 20, 1893.	Choledochotomy and cholecystotomy.	1	
63	Kehr.	Sept. 16, 1893.	Choledochotomy secondary to cholecystostomy.	1	
19	Murphy.	Sept. 23, 1893.	Choledochotomy.		1
54	Lauenstein.	Nov. 11, 1893.	Choledochotomy and cholecystostomy.		1
65	Kümmel.	Dec. 5, 1893.	Choledochotomy secondary to cholecystostomy.	1	
71	Lane.	Dec. 21, 1893.	Choledochotomy by two interventions.	1	
66	Terrier.	Jan. 11, 1894.	Choledochotomy secondary to cholecystectomy.	1	
40	Czerny.	Jan. 16, 1894.	Choledochotomy and ideal cholecystotomy.	1	
20	Quénu.	Feb. 14, 1894.	Choledochotomy.		1
64	Kehr.	Feb. 20, 1894.	Choledochotomy secondary to cholecystostomy and cysticotomy.	1	
55	Kehr.	Feb. 26, 1894.	Choledochotomy and cholecystostomy and cysticotomy.	1	
68	Thiriar.	March 2, 1894.	Choledochotomy secondary to choledocholithotripsy.	1	
41	Czerny.	May 4, 1894.	Choledochotomy and ideal cholecystotomy.	1	
21	Pozzi.	May 25, 1894.	Choledocho-duodenotomy.	1	
22	Jaboulay.	August 19, 1894.	Choledochotomy.	1	
42	Czerny.	Sept. 7, 1894.	Choledochotomy, cysticotomy, and ideal cholecystotomy.	1	
32	Michaux.	Sept. 14, 1894.	Choledochotomy and cholecystectomy.		1
72	Quénu.	Nov. 19, 1894.	Choledochotomy by two interventions.	1	
33	Michaux.	Nov. 23, 1894.	Choledochotomy and cholecystectomy.	1	
23	Lane.	Dec. 9, 1894.	Choledochotomy.		1
24	Duplay.	Feb. 7, 1895.	Choledochotomy.		1
25	Terrier.	March 19, 1895.	Choledochotomy.	1	
34	Schwartz.	May 8, 1895.	Choledochotomy and cholecystectomy.		1

the existence of which has done away with the phenomena of biliary retention,—the accidents of infection of the bile-ducts,—and has already secured for the patient a much better general condition. A secondary choledochotomy allows the removal of the obstructing calculi, re-establishes the normal flow of the bile, and invites the fistula to close from disuse, after having served temporarily as a safeguard against the accumulation or tension of the gall. Under such conditions the choledochotomy cannot be compared with the same operation on a patient intensely jaundiced and weakened from the long biliary retention, with febrile symptoms and infected liver-ducts. Three groups would include seventy of the cases we propose to study. But there remain two in which the operation of choledochotomy was performed by two separate interventions. The interest of these two cases allows their classification for study in a fourth group.

We will then consider our subject as follows:

GROUP I.—Choledochotomy—simple—twenty-five cases, table Nos. 1-25.

GROUP II.—Choledochotomy associated with interventions on—

A. The gall-bladder or bladder and cystic duct at the same time.

1. Cholecystectomy, nine cases, Nos. 26–34.
2. Cholecystotomy, eleven cases, Nos. 35–45.
3. Cholecystostomy, ten cases, Nos. 46–55.

B. The cystic duct only, cysticotomy, one case, No. 56.

GROUP III.—Choledochotomy, secondary to another operation on—

A. The gall-bladder or the cystic duct.

1. Cholecystostomy, eight cases, Nos. 57–64.
2. Cholecystotomy, one case, No. 65.
3. Cholecystectomy, one case, No. 66.
4. Cystico-enterostomy, one case, No. 67.

B. The common duct.

1. Choledocholithotripsy, one case, No. 68.

C. The gall-bladder and the common duct.

1. Cholecystostomy and choledocholithotripsy, one case, No. 69.
2. Cholecystectomy and incomplete choledochotomy, one case, No. 70.

GROUP IV.—Choledochotomy by two interventions, two cases, Nos. 71 and 72.

GROUP I.—CHOLEDOCHOTOMY—SIMPLE.

Of the twenty-five interventions of this group, notes of six cases communicated to us for publication will be found at the end of the paragraph. In all of the twenty-five the lithiasis, strictly limited to the common duct, restricted the intervention to that of simple choledochotomy. Five times the gall-bladder could not be found, thirteen times it was extremely difficult to recognize or was contracted to the

last degree. Twice the gall-bladder is noted as of normal dimensions, and five times it is not even mentioned, which would allow the supposition that it was not found or was empty. Twenty-five operations gave twelve fatal results, a mortality far beyond that of the other groups of choledochotomy. But the explanation is easily given, for in this group are found the cases operated upon *in extremis* or under unusually bad conditions; witness the two cases of Jaboulay here published, and that of Lane.

A woman suffering from jaundice of four years' duration was brought to the hospital in a very bad condition. During the two days that passed prior to operation a constant delirium and extreme prostration existed. The intervention at so late a period did not affect the delirious conditions, which soon terminated in death.

CHOLEDOCHOTOMY, SIMPLE. (25 Cases.)

No. 1. Surgeon: THORNTON. **Sex and Age:** Female, thirty-six years. **Clinical History:** Jaundice and hepatic colics for a long time; loss of flesh. **Actual Condition:** Chronic jaundice very manifest; fever. **Operation Notes:** May 9, 1889. Gall-bladder so contracted that it can scarcely be recognized; common duct contains two stones, one above the other, which are successively removed; the neighboring viscera confounded in a mass of adhesions; after extraction of the stones, the wall of the common duct is sutured, a drain introduced as far as the suture-line, and a glass tube is placed in the pouch of Douglas and brought out by an opening made in the abdominal wall just above the pubis. **Result:** Recovery rapid; several days after the operation the gall flowed from the drain. In February, 1891, the patient was visited, and her perfect recovery is noted.

No. 2. Surgeon: THORNTON. **Sex and Age:** Female, forty-three years. **Clinical History:** Nine months before the first hepatic colics appeared and lasted fifteen days, to reappear from time to time since, and accompanied with jaundice; loss of flesh. **Actual Condition:** Deep jaundice; the volume of the liver increased; an ill-defined tumor felt in the region of the gall-bladder. **Operation Notes:** November 28, 1889. The liver so large that it entirely covers the gall-bladder and ducts; numerous adhesions; isolation of the bladder impossible; cystic duct atrophied; stone in the common duct; its removal difficult on account of the size of the liver, necessitating an operation deep down in the abdomen, guiding the knife with the left forefinger; the incision of the common duct gives rise to a considerable hemorrhage traced to a vein of the omentum included in the surrounding adhesions; calculus attached to the wall is removed only after some difficulty; six fine silk stitches close the common duct, and over this line of suture the torn omentum is stitched with a running thread; a glass drain is introduced in the subhepatic region. **Result:** Recovery; postoperatory shock; the first urine contained large quantity of albumin; the fifth day the urine less colored by biliary pigments; drain removed the sixth day; colored stools the eighth day; wound completely closed the fifteenth day. Nine weeks after the operation the patient was enjoying good health; the jaundice had not yet entirely disappeared.

No. 3. Surgeon: COURVOISIER. **Sex and Age:** Female, forty-six years. **Clinical History:** An attempt at choledocholithotripsy, interrupted by the collapse of the patient, left the woman, on leaving the hospital, in September, 1889, in no way better; violent hepatic colics, chills and fever, persistent jaundice, and very bad general condition determine another entrance to the hospital. **Actual Condition:** Chronic jaundice; fever. **Operation Notes:** January 21, 1890. Numerous adhesions causing great difficulty to find a stone in the common duct; the calculus, the size of a nutmeg, situated deep down beneath the liver between that organ and the duodenum; incision of the wall of the common duct for a length of one centimetre and a half; the stone adheres to its lodge, but is finally extracted with the aid of a lever; a catheter is passed up and down the common duct, a small branch of the hepatic artery is ligated, and three silk stitches close the incision of the common duct; drain placed on the suture-line. **Result:** Recovery;

stools deeply colored the seventh day; rapid disappearance of the jaundice; wound completely healed the twentieth day, never having shown any flow of gall.

No. 4. Surgeon: Küster. **Sex and Age:** Female, forty-nine years. **Clinical History:** Hepatic colics for the last two years, becoming more and more frequent, and lately reappearing every week, with fever and jaundice, which disappears slightly but never completely during the intervals of the attacks; loss of weight, from one hundred and forty pounds to eighty-eight pounds, the actual weight. **Actual Condition:** Chronic jaundice; the volume of the liver increased; the gall-bladder perhaps to be felt. **Operation Notes:** June 11, 1890. Transverse incision near and parallel to the costal border; the colon adheres to the liver and to the gall-bladder; this latter is not dilated and contains no stone; in the dilated common duct two calculi are found; incision two centimetres in length, each edge held up with a thread loop; extraction of two large stones and several small ones; suture of the incision; first plane with catgut stitches, second plane with a running thread of fine silk; packing with iodoform gauze. **Result:** Recovery; a flow of mixed gall and blood from the wound; jaundice increases; stools uncolored; the fifth day the removal of the packing allows a hemorrhage, reproduced the eleventh day, and only stopped by cauterizing; jaundice disappears, the stools become colored, and June 30 the wound had healed completely. Reappearance of attacks of pain in November, 1890, reoccurring from time to time until August, 1891, when a cure at Carlsbad caused the elimination of two calculi, the disappearance of all pain, and complete cure.

No. 5. Surgeon: Van der Veer. **Sex and Age:** Male, fifty-one years. **Clinical History:** Hepatic colic for two years; jaundice at first temporary, but for the last year persistent; symptoms of hepatic insufficiency. **Actual Condition:** Chronic jaundice; liver small; gall-bladder imperceptible. **Operation Notes:** January 15, 1891. Vertical lateral incision; atrophied gall-bladder; adhesions; large stone (maximum diameter, five centimetres; minimum, two and a half centimetres) in the common duct; attempt to push it into the duodenum fails; incision of the common duct; extraction of the calculus; catheterization of the canal; suture of its walls with some difficulty; two rows of stitches; glass drain and iodoform packing. **Result:** *Death* the ninth day; *no post-mortem nor details.*

No. 6. Surgeon: Braun. **Sex and Age:** Female, forty years. **Clinical History:** Violent hepatic colics and persistent jaundice for the last eight months. **Actual Condition:** Chronic jaundice; the dilatation of the gall-bladder cannot be determined. **Operation Notes:** April, 1891. Curved incision parallel to the costal border; large stone in the common duct near to the duodenum, drawing up the duct which is held by an assistant; the wall is incised and the stone extracted (diameter, one centimetre); catheterization of the canal; the incision of which is closed with four stitches; drainage with iodoform gauze. **Result:** Recovery; the first stool was colored.

No. 7. Surgeon: Frank. **Sex and Age:** Female, forty-two years. **Clinical History:** Violent hepatic colics for the last two months with jaundice; seven calculi have been eliminated with the stools; attacks very frequently repeated and followed by temporary jaundice. **Actual Condition:** Jaundice; liver not increased in volume; gall-bladder not perceptible. **Operation Notes:** May 27, 1891. First incision along the right costal border; second incision from the middle of the first to the navel; adhesions of the colon and stomach to the liver; gall-bladder greatly contracted, no larger than a hazel-nut, and hardened; a stone, as large as the end of the thumb, is felt in the common duct near its opening into the duodenum; after incising the calculus is removed with the aid of forceps; considerable hemorrhage; two rows of sutures; drainage with iodoform gauze. **Result:** Recovery; no flow of bile from the wound, which was completely cicatrized the fifteenth day. Visited five months later, the complete cure was noted.

No. 8. Surgeon: Jaboulay. **Sex and Age:** Male, thirty-one years. **Clinical History:** Biliary lithiasis of long date; recently the jaundice had become more severe; a continued fever of 105° to 105.8° F.; transferred from medical to surgical ward for emergency operation. **Actual Condition:** Chronic jaundice; liver greatly increased in volume; continued high fever. **Operation Notes:** June, 1891. Operation *in extremis;*

incision on the middle line; gall-bladder empty, contracted, and adherent; in the supra-duodenal portion of the common duct a stone as large as a marble is found; incision upon the calculus, which can be removed only after its crushing, the pieces then scraped out with a curette; abscess on the inferior surface of the liver; iodoform packing. **Result:** *Death* the following evening, the acute accidents not having ceased; the temperature had fallen gradually to 100° F., but the coma had never disappeared; *post-mortem* showed angiocholitis, periangiocholitis having suppurated, and intrahepatic abscesses.

No. 9. Surgeon: RIEDEL. **Sex and Age:** Female, fifty years. **Clinical History:** Twenty-five years ago first suffered with hepatic colic, but for the last six months the attacks have been most violent; jaundice and continued pain; from one hundred and sixty-two pounds her weight has diminished to one hundred and thirty pounds. **Actual Condition:** Jaundice; liver of increased volume; gall-bladder not perceptible. **Operation Notes:** October 15, 1891. Vertical lateral incision; adhesions of the omentum to the liver and parietal peritoneum; gall-bladder atrophied to the size of an English walnut; adherent to the stomach and the transverse colon; empty; the cystic duct atrophied; in the common duct, which is greatly dilated, is found a stone which is extracted after incision; catheterization of the duct with the aid of the finger; suture of the incision with silk; no drainage. **Result:** Recovery; wound healed the tenth day; jaundice disappeared. Visited in January, 1892, the patient was in good health and had gained twelve pounds in weight.

No. 10. Surgeon: TERRIER. **Sex and Age:** Male, thirty-two years. **Clinical History:** Eight years ago first attack of hepatic colic, but without jaundice; six years ago five or six slight attacks without jaundice; four years ago three attacks; and two years ago five or six. In July, 1891, he had a most violent attack lasting six days, with fever, but no jaundice until the next month, when it came on without pain, and has since persisted; constant pain in the right hypochondrium; loss of flesh. **Actual Condition:** Chronic jaundice; liver increased in volume; at the region supposed to be occupied by the gall-bladder an ill-defined tumefaction can be felt. **Operation Notes:** April 19, 1892. Vertical lateral incision; the hypertrophy of one of the lobes of the liver was found to be the tumefaction attributed to the gall-bladder before the operation; adhesion of the transverse colon to the liver; gall-bladder cannot be found; near the hilus of the liver are found some lymphatic ganglia and a hard cord is there felt descending to the head of the pancreas, the dissection of which is difficult; in the head of this organ a calculus is distinctly felt, lying in the common duct near its termination in the ampulla of Vater; efforts to crush it or push it into the duodenum were unavailing; placing the fingers of the left hand behind and a little above the head of the pancreas an incision was made directly upon the stone, which removed showed an ovoid form with rough surface one and a half centimetres long and one centimetre wide; the duct was assured free from other obstruction by passing a No. 6 catheter in both directions; suture with four silk stitches, which included a part of the pancreas which continued to bleed a little; drain placed in the subhepatic region. **Result:** *Death* April 21, at 1 A.M. April 19, 5 P.M., the temperature = 98° F., pulse 95; April 20, A.M., temperature = 98° F., pulse 120; a slight flow of serous matter, colored yellow; P.M., temperature = 101.3° F., pulse 180. *Post mortem:* no trace of peritonitis; no liquid in the abdomen; the incision of the common duct was well closed by the sutures; gall-bladder scarcely contained a trace of bile, and had almost disappeared in the mass of contractile tissue, only as large as a hazel-nut. Histological examination of liver showed the atrophy of the hepatic cells, sclerosis of the intracellular tissue as well as that of the bile-ducts.

No. 11. Surgeon: SOCIN. **Sex and Age:** Female, thirty-five years. **Clinical History:** Five months ago, after an attack of hepatic colic, she was taken with jaundice, which has since persisted. **Actual Condition:** chronic jaundice; liver slightly increased in volume; an induration is felt to the right of the navel (adhesions?). **Operation Notes:** July 9, 1892. Transverse incision, twelve centimetres in length, commencing at the navel; gall-bladder very small; stone, the size of a prune, in the common duct, the wall of which is incised for a length of two and a half centimetres, the edges of this incision maintained with thread loops: the calculus is extracted in fragments; two rows

of stitches close the incision; the abdominal wound then sutured. **Result**: Recovery; the evening of the day following the operation symptoms of internal hemorrhage appeared; collapse; reopening the abdomen a large quantity of coagulated blood was removed, but the source of the bleeding not found; iodoform-gauze packing; complete recovery September 8. Revisited in June, 1895, the recovery is noted to be complete.

No. 12. Surgeon: DUNCAN. **Sex and Age**: Female, fifty-three years. **Clinical History**: Hepatic colic for the last twelve years, becoming more frequent, with fever and jaundice, with tendency to persist, with slight variations of intensity. **Actual Condition**: Chronic jaundice; gall-bladder not felt; fever. **Operation Notes**: October, 1892. Gall-bladder atrophied, containing no stones; in the supraduodenal portion of the common duct a calculus is found; adhering to this region is the hepatic flexure of the colon; incision of the duct and removal of a stone weighing seven grammes; the incision is left unsutured; a glass tube introduced into the common duct serves for drainage, with a second glass tube introduced by the abdominal wound. **Result**: Recovery; a colored stool on the third day; drain removed the fourth day; biliary fistula closes spontaneously at the end of three weeks.

No. 13. Surgeon: DOYEN. **Sex and Age**: Female, forty-nine years. **Clinical History**: At first a temporary jaundice which becomes permanent after several months; a bad general condition. **Actual Condition**: Chronic jaundice; the volume of the liver a little less than the normal; gall-bladder not felt; deep down behind the cartilage of the ninth rib a small tumor, the size of a horse-chestnut, can be distinguished. **Operation Notes**: 1892. Vertical lateral incision increased by a transverse section along the costal border; no trace of the gall-bladder; large stone in the first portion of the common duct, which is incised and thus allows the extraction of a calculus weighing fourteen grammes; the adhesion of the walls of the duct caused them to be torn by the extraction of the stone; catheterization; drain introduced into this duct and another into hepatic; overhand stitch to unite the torn edges and close the incision of the common duct, and over this is stitched the peritoneal and connective tissue, a running thread being used; a few superficial suture-points are then placed to assure the union of all. **Result**: *Death* the eighth day. *Post mortem:* No accumulation of bile in the peritoneal cavity; an advanced condition of biliary cirrhosis.

No. 14. Surgeon: LANE. **Sex and Age**: Female (?). **Clinical History**: Hepatic colics with jaundice for several years. **Actual Condition**: Febrile symptoms; signs of stenosis of the common duct. **Operation Notes**: December 8, 1892. Stone in the common duct, which is incised, the calculus extracted, and incision then carefully sutured; glass drain introduced into the subhepatic region; no packing employed. **Result**: *Death* the third or fourth day, probably the result of peritonitis.

No. 15. Surgeon: KEHR. **Sex and Age**: Female, forty years. **Clinical History**: Hepatic colic for the last ten years, for the last four of which the jaundice has persisted. **Actual Condition**: Chronic jaundice; liver of increased volume; gall-bladder imperceptible. **Operation Notes**: January 19, 1893. Vertical lateral incision; numerous adhesions between the liver and the transverse colon and between the latter and the gall-bladder, which is small and contracted; the dissection of the adhesions tears the serous coat of the colon slightly, which tear is repaired with two stitches; three large stones are found in the common duct between the liver and the duodenum; incision of the canal and removal of the calculi, followed by the suture of the wound; rubber drain placed on the suture line. **Result**: *Death* eighty hours after the operation; peritonitis caused by the perforation of the colon at the point where the serous coat had been injured; the suture of the common duct was in good condition.

No. 16. Surgeon: BILLROTH. **Sex and Age**: Female, fifty years. **Clinical History**: Violent attacks of hepatic colic with pronounced jaundice. **Actual Condition**: Chronic jaundice; a hard mass is felt in the region of the gall-bladder (adhesions). **Operation Notes**: February, 1893. Choledocotomy or choledocostomy; the region of the gall-bladder is occupied by a thick mass of adhesions, behind which is found a dilated pocket, assumed to be the gall-bladder; this is incised, and from it is extracted in fragments a large calculus, and another stone lower down disappears on palpation; the

edges of this pocket are brought to the abdominal wound and the whole dressed. **Result:** *Death* the seventh day; a large quantity of liquid of brownish color flowed from the wound; bloody stools; *post-mortem* showed that the pocket was the dilated common duct; the gall-bladder was entirely atrophied.

No. 17. Surgeon: LAUENSTEIN. **Sex and Age:** Female, thirty-five years. **Clinical History:** Hepatic colic for five years; persistent jaundice for the last three months. **Actual Condition:** Chronic jaundice; liver of increased volume; gall-bladder not perceptible. **Operation Notes:** March 16, 1893. Vertical lateral incision; gall-bladder atrophied and adhering to the omentum, but contains no stones; near to the duodenum, in the common duct, is a large calculus; incision between two thread loops; considerable hemorrhage; extraction of the stone; seven stitches with catgut close the incision; iodoform packing. **Result:** Recovery; a colored stool on the fifth day; the flow of gall from the wound ceases the sixth day, and the fistula is closed entirely the fifteenth day.

No. 18. Surgeon: JABOULAY. **Sex and Age:** Male, thirty years. **Clinical History:** Biliary lithiasis for a long time; intense jaundice and continued fever. **Operation Notes:** April, 1893. Emergency operation, the patient *in extremis;* this case closely similar to No. 8 of this table; three calculi removed from the common duct. **Result:** *Death;* suppurative angiocholitis.

No. 19. Surgeon: MURPHY. **Sex and Age:** Female, thirty-five years. **Clinical History:** Biliary lithiasis for three years; hepatic colic twice without jaundice; for the last five weeks jaundice, persisting pain, and fever. **Actual Condition:** Intense jaundice; gall-bladder not perceptible; fever = 103° F. **Operation Notes:** October 23, 1893. Atrophied gall-bladder; a large stone in the middle portion of the common duct, which is incised; slight hemorrhage; extraction of the calculus; suture of the incision with a running thread; drainage with iodoform gauze. **Result:** *Death* the third day; no post-mortem; probably a peritoneal infection.

No. 20. Surgeon: QUÉNU. **Sex and Age:** Female, forty-one years. **Clinical History:** Jaundice having persisted for four months; no pain and no hepatic colic. **Actual Condition:** Liver of increased volume; gall-bladder not perceptible. **Operation Notes:** February 14, 1894. Median incision; gall-bladder atrophied, its fundus two or three centimetres behind the edge of the liver; stone as large as an olive in the supraduodenal portion of the common duct; a hand passed beneath the pedicle of the liver raises it up and fixes the calculus incision, the edges of which are held up with forceps; extraction of the stone and suture with five fine silk stitches, and a second row of stitches repairing the torn gastro-hepatic omentum; isolation of field of operation and drainage as far as the common duct. **Result:** *Death* the third day; first day vomit of bloody matter; second day, small quantity of blood in the dressing; jaundice increases; *post-mortem* shows obliteration of bile-ducts by coagulated blood.

No. 21. Surgeon: POZZI. **Sex and Age:** Female, thirty-seven years. **Clinical History:** Jaundice constantly increasing for the last three years; hepatic colic for the same lengh of time, very frequent, but less so recently; continued dull pain in the right hypochondrium; incomplete stenosis of the common duct; stools are colored; general condition very bad; chills and fever; epistaxis and metrorrhagia. **Actual Condition:** Chronic jaundice; liver of greatly increased size; gall-bladder not perceptible. **Operation Notes:** May 25, 1894. Choledocho-duodenotomy; median incision with transverse incision of half of the right rectus; intestine adheres to liver; gall-bladder contracted and shrivelled, very difficult to recognize; in the midst of a mass of adhesions a tumor as large as an English walnut, appearing to occupy the place of the pylorus, but a scratch of this tumor lets out bile, a catheter, introduced by this orifice, feels a stone as large as an almond, removed by incision of the wall; the calculus lay partly in the common duct and partly in the duodenum (its first portion); suture of the incision with three rows of stitches with silk thread; drainage and iodoform packing. **Result:** Recovery; during the first five days pulmonary congestion and insufficiency of the hepatic functions; drain removed the fifth day; no flow of bile; at the end of July the jaundice had almost

entirely disappeared; liver had diminished in size. Seen in May, 1895, the complete recovery of the patient is noted.

No. 22. Surgeon: JABOULAY. **Sex and Age:** Female, fifty years. **Clinical History:** Violent hepatic colic for five years, becoming more frequent; patient has been confined to her bed for two years; intense jaundice; attacks of fever. **Actual Condition:** Chronic jaundice; fever. **Operation Notes:** August 19, 1894. Median incision; gall-bladder of average size; two stones in the common duct; incision and extraction; incision closed with two points of catgut; iodoform packing. **Result:** Recovery; packing removed the tenth day; one month later the biliary fistula was completely closed. Visited April 17, 1895, complete recovery is noted, and a gain in weight of twenty-five pounds.

No. 23. Surgeon: LANE. **Sex and Age:** Female (?). **Clinical History:** Jaundiced for four years; general condition bad; on entrance to the hospital delirium and prostration. **Operation Notes:** February 25, 1895. Emergency operation *in extremis;* colon adheres to the gall-bladder; removal of several stones from the common duct after its incision; drainage by a rubber tube introduced into the canal; iodoform packing. **Result:** *Death* without any relaxation of the delirium nor change in the bad condition noted before operation.

No. 24. Surgeon: DUPLAY. **Sex and Age:** Female, thirty-six years. **Clinical History:** Hepatic colic three years ago, accompanied by fever and jaundice which lasted six weeks; in January, 1894, jaundice reappeared, without any pain, and has now lasted thirteen months; for the last six months the hepatic colic has reappeared and become more and more frequent. **Actual Condition:** Chronic jaundice; liver not increased in size; gall-bladder not perceptible. **Operation Notes:** February 7, 1895. Median incision supplemented by a transverse; transverse colon adheres to the liver; no trace of the gall-bladder can be found; a stone is felt in the dilated common duct a few centimetres beneath the liver and extracted by incision of the wall; considerable hemorrhage of venous origin; three silk threads close the incision; iodoform packing. **Result:** *Death* the third day; no gall had flowed into the packing; *post mortem:* no trace of peritonitis; the sutures had held well; signs of insufficiency of the hepatic function.

No. 25. Surgeon: TERRIER. **Sex and Age:** Female, fifty-eight years. **Clinical History:** Twenty years ago, dull pain in the right hypochondrium with crises of acute pain from time to time during eight months, but no jaundice; five years ago hepatic colic during one month; no jaundice; eighteen months ago more crises with jaundice, which still persists with dull pain in the right hypochondrium; fever from time to time; loss in weight from one hundred and sixty-six to one hundred and seventeen pounds. **Actual Condition:** Chronic jaundice; liver of increased size; gall-bladder not perceptible; spleen hypertrophied. **Operation Notes:** March 19, 1895. Vertical lateral incision; omentum adheres somewhat to the liver; gall-bladder cannot be found; movable stone in the supraduodenal portion of the common duct the size of a pea; incision; considerable hemorrhage of venous origin; two forceps stop the bleeding; compression for a few minutes; after removing the compression the calculus is felt, but immediately escaped from beneath the finger, passing up the hepatic duct, where every effort failed to find it; packing with sterilized compress and gauze. **Result:** Recovery; no temperature above the normal; the first stool on the fourth day was slightly colored and normally so after the eighth day; removal of drain the tenth day; fistula completely closed the twenty-fifth day; jaundice disappeared; pneumonia April 20. Visited May 25, it is noted that this fistula reopened and bled slightly, but let out no bile; no jaundice; stools normally colored; this patient died during the month of June, not able to recover from the effects of pneumonia.

Such cases can have no bearing on the question of the value of the operation, and only serve as a warning of the inevitable result of postponing too long the surgical aid required. Of the nine fatal cases remaining, three are certainly to be attributed to peritonitis. For the first, Kehr,

Case XV., we read in the description of the operation that during the liberation of the gall-bladder, which adhered strongly to the transverse colon, a portion of the serous coat of the bowel was torn, repaired with two sutures, but their inefficacy was shown later by the perforation of the colon and the issue of intestinal matter into the peritoneal cavity, causing acute peritonitis. In the second, Lane, Case XIV., the cause of the peritonitis is attributed by the surgeon to the insufficient drainage procured by the glass tube inserted without gauze to protect the wound. In the third, Murphy, Case XIX., the peritonitis seems to be a general infection of the peritoneum, to judge by the progressively increasing temperature. The absence of the post-mortem report leaves the source of the infection undetermined.

In three cases, X., XIII., and XIV., the fatal result seems due to the impossibility to re-establish the function of the liver. The post-operatory results show no clinical signs of infection, and the post-mortem in each case finds no abnormal cause other than the pronounced cirrhotic condition of the liver. In Case X., Terrier's, the histological examination showed great alteration of the organ, noted particularly for "the atrophy of the hepatic cells, the sclerosis of the intercellular connective tissue, manifestly originating within the liver-ducts themselves, which were markedly transformed by sclerosis." Duplay and Doyen both accuse the cirrhosis of the liver, the insufficient hepatic function, as the fatal factor of their cases. One patient, Quénu, Case XX., was lost by a peculiar accident; and being the only case in which a hemorrhage played a fatal *rôle*, we reproduce a part of the history.

Operation.—February 14, 1894. In the common duct a stone as large as an olive can be felt, which is easily displaced towards the duodenum. Incision of the duct, the edges of which are held by forceps, and with the aid of a director the calculus is removed. The common duct sutured with five points of fine silk, suture of the gastro-hepatic omentum, and isolation of the field of operation. Drain placed in the cavity. Suture of the abdominal wound. Iodoform dressing. The patient vomited three times during the afternoon. Between 7 and 7.30 P.M. she vomited a little blood and some bilious matter. At 8 P.M. another vomit of blood. The quantity of matter vomited each time is estimated at eight tablespoonfuls. Temperature, 98° F.; pulse, 90.

February 15. Vomited several times, each time a small quantity of black liquid. The dressing, in which is noted a small quantity of blood, is changed. No trace of gall could be found in the dressing. She has passed four hundred grammes of urine since the operation, and seems to be a little less jaundiced. Temperature in the evening, 100.4° F. Gas passed *per anum*.

February 16. Temperature, A.M., 100° F. She has vomited once. Tongue dry, face drawn, agitation, subdelirium, great prostration. Within forty-eight hours the skin has again become very yellow. Every symptom of cholæmia. A trocar plunged into the gall-bladder fails to give issue to any liquid. Urine five hundred grammes. Injection of two hundred grammes of artificial serum. Temperature, P.M., 101.5° F. Death during the night.

Post-mortem.—Stomach: full of bile. The intestine and omentum stained green. No traces of inflammatory adhesion. The large intestine contains colored matter,

in the centre of which is found a putty, chalk-like substance. The *pancreas* appears normal. The *kidneys* yellow, but without apparent alteration. The *spleen* is small. The *small intestine* is coated internally with blackish matter, which increases in quantity as the duodenum is approached. The *duodenum* is greatly dilated, and adherent to it is the bottom of the gall-bladder, which cannot be detached. This extremity of the gall-bladder is separated from the border of the liver by a distance of one and a half inches. The base of the bladder adheres to the liver on all sides, forming a centre of retraction, the traces of which are seen in the lines radiating over the surface of the liver; and here are manifestly the alterations due to perihepatitis. The *gall-bladder* is extremely small, atrophied, thick, and full of thick, colored matter, a mixture of blood and bile. The *cystic duct* is absolutely free, a probe introduced by the orifice penetrates easily into the hepatic duct or into the gall-bladder. The *common duct* is found plugged with coagulated blood, the sutures of the duct are intact. The canal is now incised for its entire length, as also the gall-bladder, the cystic and the hepatic ducts; all are found filled with the same black matter that was found in the gall-bladder.

This is the only fatal case due to hemorrhage that we have found; but in several of the other histories it would seem probable that a similar but slight hemorrhage had taken place in the interior of the common duct, causing a temporary reobstruction of the passage, or manifesting itself by the slight oozing of blood from the gall-bladder, which had been utilized for a supplementary cholecystostomy. Details of the two remaining deaths are lacking. The case of Billroth was operated by the surgeon, believing that he performed a cholecystostomy. The post-mortem revealed that the dilated common duct had been mistaken for the gall-bladder; details as to the cause of the fatal result are not given. Van der Veer not only fails to report the post-mortem of his case, but even forgets to note the post-operatory temperature.

SUMMARY.

Of the twelve deaths, three are due to operation *in extremis*, three to the loss of the hepatic function beyond repair, three to peritonitis, one to internal hemorrhage, and two to an unknown cause. One-half of these, the first six, can be declared the direct result of too long postponement of the surgical intervention.

CASE I.—Communicated by Dr. Jaboulay, Table I., No. 8. Chronic jaundice; calculi in the common duct; angiocholitis and suppurative perangiocholitis; extra- and intrahepatic abscesses; immediate intervention *in extremis;* choledochotomy; death.

Man, aged thirty-one, brought from the medical ward of Dr. Charnicel for immediate operation. The jaundice of the patient had of late rapidly increased. The liver was very large and painful. Unremitting fever, 104.9° F. to 105.8° F.

Operation in June, 1891.—Incision on the median line. The gall-bladder empty, retracted, and adherent. The finger, introduced as far as the pedicle of the liver, feels a large stone. Incision of the duct. The calculus adheres to the walls, and can be detached only by crushing and scraping out the pieces with a curette. The inferior surface of the liver, before the extraction of the stone, showed two small, white masses, one near to the bladder, the second close to the suspensory ligament. There were abscesses simulating tumors of secondary infiltration. The region be-

neath the liver was packed with long strips of iodoform gauze. The abdominal incision then reduced by suturing. Death during the night of the following day. The temperature fell from 104° F. to 102.2° F., and thence to 100.4° F. The coma had never ceased.

Post-mortem.—Inflammatory adhesions on the right lobe of the liver. Serous matter in the peritoneum. The blackened liver weighed two thousand six hundred grammes. The gall-bladder, as large as an English walnut, adhered to the transverse colon. The common duct started directly from the bladder, the entire cystic duct having disappeared. The common duct, greatly enlarged, contained in its superior third the *débris* of the stone extracted during the operation. The intrahepatic ducts, the hepatic duct, and its branches of bifurcation were greatly dilated. The liver was hard, of dark yellow color on section, and peppered with abscesses, most of them small, but two or three as large as eggs.

CASE II.—Also from Dr. Jaboulay, Table I., No. 18. Of the same type.

Man, aged thirty, operated *in extremis* in April, 1893. Suppurative miliary angiocholitis. The left lobe of the liver was particularly enlarged. Three calculi superposed in the common duct.

CASE III.—Communicated by Dr. Jaboulay, Table I., No. 22. Chronic jaundice; calculi in the common duct; choledochotomy; recovery.

Miss R., aged fifty, long time syphilitic. Hepatic colic for five years, exceedingly painful, and more and more frequent. Three years ago a cure at Vichy was tried. For two years the patient has been confined to her bed.

Complexion of a greenish hue; urine dark-brown; stools completely decolorized; fever from time to time. She has ideas of suicide that she has confessed to her family physician.

Operation.—August 19, 1894. Incision on the median line. The gall-bladder of ordinary dimensions. The liver pushed upward exposes a cavity, limited in front by the liver, behind by the anterior surface of the gastro-hepatic omentum, and beneath by the pylorus and stomach. Two calculi are felt in the common duct. Incision directly upon them and extraction of two large stones about two centimetres square. The common duct is as large as the femoral artery and its walls as thick as those of an artery. Two catgut stitches close the incision. Iodoform packing which was removed ten days later. The patient left the hospital nineteen days after the operation. One month later the fistula closed, and April 17, 1895, her family physician reports her in excellent health, with rosy complexion and a gain in weight of twenty-five pounds.

CASE IV.—Communicated by Dr. Lauenstein, Table I., No. 17. Chronic jaundice; calculus in the common duct; choledochotomy; recovery.

Woman, aged thirty-five, operated upon March 16, 1893. For five years she had suffered with hepatic colic. Jaundiced the last three months. Discoloration of the stools. Gall-bladder imperceptible. The liver of greatly increased volume, painful when pressure was brought upon the superior part of the epigastrium.

Operation.—Long incision upon the external border of the right rectus, exposing the dark liver of increased size. The gall-bladder contracted behind the sharp edge of the liver. The bottom of the bladder adhered to the omentum, its walls thickened and white, containing no stone, but deeper down, near the duodenum, could be felt a large calculus, slightly movable. Long incision of the common duct, the edges maintained with two thread loops. Considerable hemorrhage. Extraction of the

calculus of ovoid form, its maximum diameter 2.25 centimetres, minimum fifty millimetres. Suture of the wound in the common duct with seven catgut stitches. Iodoform packing on the suture line. Dressing.

March 19. A flow of gall from the wound; repeated the 20th. Three stools colored by the bile on the 21st. Another stool the 22d. No further flow of gall from the wound.

April 2. The fistula had closed completely; the jaundice had disappeared. Rapid recovery.

CASE V.—Communicated by Professor Duplay and Dr. Demoulin, Table I., No. 24. Biliary lithiasis; hepatic colic; chronic jaundice; calculus in the common duct; choledochotomy; death from insufficiency of the hepatic function.

Woman, M. R., aged thirty-six; domestic; entered the Hôtel Dieu, ward Nôtre Dame, bed eleven, January 19, 1895.

Menstruation at the age of fifteen, has borne four children, all of whom died of acute affections. The patient was never ill anterior to 1892. Three years ago, without appreciable cause, she was taken with abdominal colic of maximum intensity about the navel and epigastrium. The colics were accompanied by vomiting, and, soon after, her stools were discolored. This condition lasted eight days, but the patient was confined to her bed for a month after the disappearance of the painful crises, because of some feverish illness, the nature of which she cannot define. During this time, at different intervals, she suffered from colic, but of a less painful nature than the first attacks. She then was intensely jaundiced for six weeks, when all became normal again. A year ago the patient yellowed but without colic, and her general health remained good. Six months ago, the jaundice not having disappeared, she was taken with hepatic colic which has not since ceased. For the last three months, the crises reappeared every week, and lasted for about twelve hours. In November, 1894, the patient was cared for at the Hôpital St. Antonie, by Drs. Ballet and Harrot, and the latter on account of the persistent jaundice recommended a surgical intervention.

Actual Condition.—January 20, 1895. The patient is in good condition, says that she has not lost flesh since the beginning of her trouble, nevertheless she has had no menstruation for three months and is not pregnant. The jaundice is very pronounced and causes a disagreeable itching, but there is no cutaneous eruption. The appetite is good, no constipation, daily stools, discolored matter of foul odor. The quantity of urine for twenty-four hours varies between seven hundred and one thousand grammes, of a dark-brown color, and containing a large proportion of urobilin. All of the internal organs appear to be healthy. Careful examination of the liver fails to detect its increased volume. The gall-bladder is not distended. There is no appreciable tumor. The hepatic colic, persistent jaundice and discolored stools, in the presence of the good general condition of the patient, the absence of fat in the fæcal matter, and particularly the non-distention of the gall-bladder determine a diagnosis of chronic jaundice due to stenosis of the common duct by stone, and a laparotomy is proposed to confirm the diagnosis and to permit the suitable intervention.

Operation.—February 7, 1895. Chloroform. Median incision, from the xiphoid cartilage to the navel, a length of fifteen centimetres. Hæmostasis. Incision of the parietal peritoneum. The right edge of the incision drawn well outward; the hand introduced into the abdominal cavity can easily explore the convex surface of the liver, but cannot reach the inferior surface. Numerous adhesions between the transverse colon and the liver are slowly detached without great difficulty, and cause only

an insignificant hemorrhage. The edge of the left lobe of the liver is now exposed, but insufficient work-room necessitates the transverse incision of the right rectus at the costal border. The liver is now exposed, of abnormal appearance, a dark-yellow color. An assistant draws the border of the liver, which projected a little beyond the costal arch, upward, and thus allows the easy exploration of the inferior surface, the anterior portion of which is irregular, due in part to the broken adhesions of the transverse colon. No trace of the gall-bladder can be found, but Spiegel's lobe is greatly hypertrophied. The free border of the gastro-hepatic omentum is carefully explored from the border of the liver to the duodenum, but without success. The head of the pancreas is found unaltered, with no trace of neoplasm or calculus. The finger is now introduced into the narrowed foramen of Winslow, feels immediately a hard stone in the dilated common duct, a few centimetres beneath the inferior surface of the liver. An effort to seize the stone between the thumb and forefinger only succeeds in pushing it higher up, whence it is brought down with some difficulty and there maintained by an assistant. Sterilized towels are introduced to protect the abdominal cavity from the gall, and the common duct is incised directly upon the stone for a length of one centimetre. The immediate venous hemorrhage that took place was sufficiently severe for a moment to cause a suspicion that the vena porta had been wounded, but a rapid compression of the region soon stopped all bleeding, the source of which was then recognized in the walls of the dilated common duct. The assistant then easily succeeds in enucleating the stone from its lodge. The extraction of the calculus is followed by oozing of a few drops of thick black gall. The edges of the incision of the common duct are sewn with three silk stitches. Careful toilet, Mickulicz packing with three bands of iodoform gauze, one passing beneath the inferior surface of the liver, the two others to the right and left of the wound of the common duct, against the coils of the intestine. Complete suture of the transverse incision of the abdomen and partial suture of the vertical wound by which the extremities of the gauze bands are brought out. The operation lasted one hour and a quarter. The patient was greatly depressed on recovering from the anæsthetic; two hypodermic injections of ether were given. Six hours after the operation the shock was still manifest. Temperature 97.7° F. The dressing is examined and found saturated with blood, but no real hemorrhage. No flow of gall could be detected. During the night, champagne, injections of ether, and thirty grammes of artificial serum were administered.

February 8, A.M. Condition much better. Temperature 98° F., but the pulse, as the evening before, is slight, rapid, and cannot be counted. A catheterization of the bladder withdraws about five hundred grammes of urine, the amount secreted since the operation. This urine is deeply colored by bile. The abdomen is not painful. The liquids taken into the stomach are occasionally vomited. Once or twice the vomited matter was like soot, but of small quantity. Same condition in the evening. Temperature 100.4° F. Pulse slight, irregular, and very rapid. Considerable agitation during the night.

February 9, A.M. Temperature 101° F. Pulse the same as before. No abdominal reaction. Agitation which ceases at noon, and death intervenes at 8 P.M., its cause unappreciable. No clinical signs of hemorrhage or of peritonitis.

Post-mortem.—February 11. No peritonitis, no blood in the abdominal cavity. The packing is stained with blood, but no trace of bile can be recognized. The sutures of the common duct, perfectly in place, did not completely close the incision. A director introduced from the duodenum into the duct passed freely along the canal, the calibre of which equalled that of the little finger. There was no stricture throughout the length of the common duct. The *liver*, of dark-yellow color tending towards green, presented a smooth convex surface. Spiegel's lobe greatly enlarged. On the inferior surface of the liver could be seen the trace of the adhesions with the

colon. The liver carefully detached from the diaphragm was removed from the abdomen together with the duodenum and a large part of the pancreas. The two last organs normal, the liver somewhat increased in size. The *gall-bladder* could not be found, but in the groove usually occupied by that organ was a slender fibrous cord, somewhat dilated towards its centre, with a small irregular cavity large enough to hold a pea. The *spleen* of normal size. The *kidneys* apparently sound. The *intestine* was without trace of bile, and this, with the absence of this liquid already noted from the packing, would seem to prove that the liver had not secreted since the operation. The *stone* was ovoid with smooth surfaces, its maximum diameter fifteen millimetres; minimum twelve millimetres.

CASE VI.—Communicated by Professor Terrier, Table I., No. 25. Chronic jaundice; hepatic colic; feverish attacks; calculus in the common duct; choledochotomy without lithectomy.

Woman, A. C., aged fifty-eight, entered the Hôpital Bichat March 6, 1895. Menstruated at the age of thirteen; always regular. Married at nineteen; has given normal birth to five children, all of whom died young. At the menopause, at the age of fifty-two, she had during several months attacks of severe metrorrhagia. Has never had an infectious disease. In 1874 she had a great deal of pain, commencing at the epigastrium, passing under the right costal arch and radiating into the shoulder of the same side, causing a continuous dull ache with acute crises from time to time. This condition lasted for eight months, but during this time there was no jaundice. Good health from 1874 to 1879. In August, 1889, the hepatic colic recommenced and lasted a month, again without jaundice. In September, 1893, the colic appeared again, but less violent than during the other attacks. One month later, without any reappearance of pain, the patient became jaundiced, and has since remained so with slight variations in intensity. Since the very beginning of the coloration of the skin, the patient has remarked the discoloration of the stools and that the urine was deeply stained with the bile pigments. As the icteric condition became more marked, the severe attacks of hepatic colic were less and less frequent; but the patient felt and continues to feel almost constant pain at the epigastrium and under the right costal arch, a pain which the patient declares has never left her for the last eighteen months. About a month after the appearance of the jaundice the daily attacks of fever with chills and sweating commenced, hepatic intermittent fever reappearing each evening from November, 1893, to September, 1894. The weight of the patient, normally about one hundred and seventy pounds, until August, 1893, diminished to one hundred and twenty-one pounds in March, 1894, and actually she weighs only one hundred and seventeen pounds at present. Medical treatment for the last year and a half has produced no result.

Actual Condition.—Jaundice very intense, daily stools absolutely discolored. Urine deeply dyed with biliary pigments. The liver of largely increased volume, its inferior border easily perceived by palpation, passes the costal margin a distance of two inches on the axillary line of two and a half inches on the mammary line. The liver traverses the epigastrium obliquely; its border, perceptible four inches below the xiphoid cartilage, disappears beneath the left short ribs and is almost in contact with the spleen, itself hypertrophied. The approximate vertical measure of the liver is five inches and a half on the mammary line, increasing to seven and a half inches in the anterior axillary line. Following the sharp edge of the liver, at a point a little to the inside of the vertical mammary line, the niche of the gall-bladder can be distinctly felt, but at this spot the most careful palpation cannot discover the bladder itself. By this examination it is found that the maximum pain is placed by the patient at a spot nearer to the median line than the above described niche, between this and the navel. The spleen is greatly hypertrophied: its inferior edge

at four fingers' breadth beneath the costal border, touches the brim of the pelvis, its superior limit, denoted by the dulness of the percussion note, is found three inches above the costal arch, surpassing by a finger's breadth the cartilaginous point of the tenth rib. The diameters of the spleen are estimated at seven inches for the vertical, six and a quarter for the width. About a quart of urine is passed in twenty-four hours, acid in reaction, density 1013, containing seventeen grammes of urea per litre. No albumin; no sugar. A great quantity of bile pigments. To examine the function of the liver, the patient is given, March 15, on an empty stomach one hundred and fifty grammes of sugar syrup. The urine, examined hourly for the six following hours, contains no sugar. Actually the patient is not suffering from febrile attacks.

Operation.—March 19, 1895. Vertical incision on the external border of the right rectus. The edge of the large liver is situated low down in the abdomen. Some adhesions of the omentum to the liver are detached and two silk ligatures applied to bleeding points of the omentum. The gall-bladder, completely atrophied, cannot be found. The edge of the liver held up with a spreader, the parts having been protected with sterilized towels, the hands of an assistant keep the intestinal coils pushed down and to the left. The right index explores the pedicle of the liver, but without success. The left index, introduced and placed beneath the pedicle while the right index explores the anterior surface of the liver, discovers towards the duodenum a stone as large as a pea and movable. The great hypertrophy of the liver increased the depth of this portion of the common duct and caused considerable difficulty in gaining access to the canal. The finger kept upon the stone served as a guide for the introduction of a Reverdin needle, the point of which struck a hard substance, and a cotton sponge applied to the pricked wall brought out a few drops of gall. Still using the finger as a guide, a small incision was made in the wall, incision immediately followed by venous hemorrhage. A momentary compression diminishes but does not stop the bleeding, and two pressure forceps are applied temporarily to the bleeding points. These, with a short compression, complete the hæmostasis. After this the stone is again sought for at the place incised, but the finger feels it only to let it escape beneath the liver, where every effort to find it was unavailing. The wound carefully packed, the larger part of the abdominal incision was closed with sutures in three planes; the peritoneum with fine silk, the aponeurosis with larger silk, and the skin with silkworm gut. Dressing of sterilized gauze covered with sterilized cotton and the whole kept in place with a flannel bandage.

In the evening the patient was in good condition. Temperature, 98° F.; pulse, 85; respiration, 30. She has vomited twice during the day.

March 20. At the dressing there was a slight oozing of blood. A part of the packing is removed. Temperature, A.M., 99.5° F.; pulse, 80; respiration, 24. Temperature, P.M., 99.8° F.; pulse, 86; respiration, 24. Seven hundred grammes of urine in twenty-four hours.

March 21. Removal of almost all of the packing. Gas passed *per anum.* Urine, eight hundred grammes. Temperature, A.M., 98.4° F.; pulse, 80; respiration, 20. Temperature, P.M., 98° F.; pulse, 80.

March 22. The rest of the packing replaced by sterilized gauze, slight oozing of yellow matter. An enema provokes yellow stools. Urine, nine hundred grammes, not so deeply dyed. Temperature, A.M., 97.6° F.; P.M., 98° F., and continued normal during the convalescence. The jaundice disappears.

March 23. Dressing. Slight oozing of greenish-yellow matter.

March 24. Dressing. Slight oozing of greenish-yellow matter. An enema gives yellow stools. Jaundice diminishing.

March 26. Removal of the stitches; enema; yellow stools.

March 27. Slight flow of greenish matter. Stools normally colored.

March 29. Flat dressing.

April 3. Mimimum flow from the fistula.

April 5. Cauterization of the fistula; dressing with vaseline and sterilized gauze.

April 7. The patient leaves her bed and quits the hospital.

April 12. The jaundice has almost entirely disappeared. There remains only a slight trace on the upper portion of the thorax. The conjunctivæ are white. The mark of the abdominal incision measures five and a half inches. The union is solid and supple. A little more than an inch below the superior extremity a small opening is seen, remaining from the fistula, which secretes a very slight quantity of liquid. Stools and urine normally colored. Appetite, digestion, and sleep all excellent. No pain whatever in the hypochondrium. April 16, the fistula closed. Some time after the return of the patient to her home she was taken with acute pneumonia, and on May 23 and 24, probably influenced by her cough, the fistula reopened to give issue to a little blood, but no gall. The hemorrhage, probably due to the fistulous walls, rapidly ceased under compression. The jaundice had entirely disappeared. The stools were colored. June 15 the patient was again seen. No jaundice; stools, normally colored, but the condition of the lungs was extremely bad. Death as a result of pneumonia at the end of June.

(To be continued.)

A CASE OF SIMPLE SEROUS RECURRENT PLEURAL EFFUSION: ITS FINAL OUTCOME.

BY J. C. MULHALL, M.D.,

St. Louis.

Mr. J. L. G. C. was sent me March 1, 1893, by his physician. There existed on the left side the classical symptoms of a serous effusion, confirmed at once by the hypodermic needle. His history was that four months before he had been suddenly seized with pain in the side, fever, general prostration, dry cough, and dyspnœa, most probably, therefore, a simple pleurisy, *ab initio*. The diagnosis, however, was pneumonia, and, as after six weeks dulness and dyspnœa still existed, he was sent to California. Here the dyspnœa increased, and, without consulting a physician, he returned, imbued with the idea that he preferred to die at home. When crossing the mountains outward and homeward bound he noticed great increase of dyspnœa. He was placed under my care.

He was a small, slender man, of sallow complexion, bad digestion, constipated habit, phosphatic urine, and with arteries somewhat resistant. He was forty-four and, though not a drunkard, had used whiskey immoderately. Taking into consideration that the effusion had lasted four months, that he was beyond the elastic age, that his general health was bad, a most guarded prognosis was made as to the future usefulness of the left lung. Sixty-two ounces of serous fluid were removed at the first tapping, with considerable relief to the dyspnœa, without complete cardiac

replacement. In three weeks there was reaccumulation of fluid, during which interim repeated examinations disclosed no vesicular murmur. During the next six months the pleural cavity was tapped eight times, the fluid gradually diminishing in quantity, the ninth tap yielding only forty ounces. There was still no vesicular breathing to be heard. About this time he became impatient and asked, "What is the final outcome of this to be? Am I to be indefinitely tapped? Cannot something radical be done to prevent the reaccumulation of the fluid?" These questions, from my own personal experience and from our somewhat limited literary resources at St. Louis, I could not answer, and they form the motive for my report of this case.

By means of cold water surface friction to the skin, a rigid dietary, percussions over the liver, abdominal massage, flexure and extension of all the joints, daily open-air driving, the tongue had become clear, the bowels moved without drugs, the urine had become normal, the general health was greatly improved. There was rapid compensatory enlargement of the right lung. The patient could walk a mile, slowly, with but slight dyspnœa. The propriety of performing Estlander's operation I discussed with several of our best men. Opinions were various. Like myself, not one had ever known multiple rib resection to have been performed in such a case. In view of his great improvement and of the unknown danger of Estlander's operation in such a case, I compromised matters by sending him to Denver to be aspirated there, thinking that, though expansion of the left lung was hopeless, compensatory enlargement of the right lung would more rapidly develop at such an altitude. Dr. Lemon, at Denver, aspirated him twice in thirty days, when, for reasons foreign to his health, he returned to St. Louis. The ratio of improvement was not greater than at home. Within the next four months I aspirated three times. On the last occasion, but thirty ounces of fluid could be, with difficulty, removed. The right side had greatly increased in all diameters, vesicular resonance being found four inches below the nipple. He was able to attend to his ordinary duties, those of book-keeper and assistant manager of a detective agency. The whistling respiration audible ten feet away at our first interview had quite disappeared. He was satisfied at once more being able to earn his salary. My intention was to tap the side every two months, in order to give occasional impetus to the expansion of the right lung. Thus, thirteen months from the first aspiration a practical cure may be said to have been effected. Two months later I was called to see him and found him to be suffering from an acute attack of what I judged to be la grippe of the cerebral and abdominal type with no involvement of the respiratory organs. I placed him under the care of another physician, who concurred in the diagnosis. He lingered two months, and died. At the autopsy the cause of death was found to be tuberculous peritonitis. The right lung was healthy and very large in proportion to the anatomy of the rest of the body. The left was an airless stump, bound to the vertebral column. The

pleura, parietal and diaphragmatic, had thrown out inflammatory material, which, in coalescence with the pericardium, had filled up the lower portion of the pleural cavity. This, assisted by the remains of the left lung and the encroachment of the right lung on the left side, left a cavity which contained twenty-five ounces of serum. Sections from the left lung showed various phases of connective-tissue proliferation. It would seem, therefore, that in simple, serous, recurrent, pleural effusion, even at middle age or beyond, repeated aseptic aspirations, with general hygienic measures, may effect a practical cure without expansion of the affected lung, and that a year or more may be consumed in this manner before multiple rib resection is practised.

Since writing the above I have read the London correspondence of the *New York Medical Record* of May 25, 1895, that, at the Medical Society of London, Dr. S. West related the case of a woman, aged thirty-one, whose chest he aspirated thirty-seven times within a year. With misgivings, he consented to the chest being opened. An empyema developed and for a time her condition was critical, but ultimate recovery and expansion of the lung ensued. Dr. Hall said it was always undesirable to open the chest in simple serous effusion, and that he would tap seventy times seven, if need be, so long as the effusion is clear.

My case seems to teach that even when the lung will no longer expand a practical cure may be effected without opening the chest.

CLINICAL LECTURES.

LIGATURE OF THE INNOMINATE ARTERY.

CLINICAL LECTURE DELIVERED AT THE BOSTON CITY HOSPITAL.

BY HERBERT L. BURRELL, M.D.,

Surgeon, Boston City Hospital; Assistant Professor of Clinical Surgery, Harvard University.

GENTLEMEN,—The case which we have before us this morning is one of aneurism of the innominate artery, and undoubtedly my colleague, Professor Mason, has told you the history.

The medical history of the case is as follows: The patient, a male, R. F., was fifty-four years of age, married, a clerk, and was under the care of my colleague, Dr. A. L. Mason.

The family history was as follows: The father died of old age; the mother, a brother, and one sister died of consumption; three sisters are alive and well.

The present history is as follows: The patient had always been well until two years ago, when he noticed a little shortness of breath. He had never had any venereal disease, rheumatism, or chorea. He had never worked very hard, nor was he of a nervous temperament. About eighteen months ago he noticed a "lump in his throat" on the left side, which, on exertion, seemed to throb and to choke him. There was no pain. The lump has increased in size but very little. About a fortnight before entrance he had to walk some distance, since which time he has had some dyspnœa and the choking sensation has increased. The patient sleeps well, his appetite is good, his bowels are regular, and there is no palpitation of the heart.

Physical Examination.—The patient is well developed and nourished. The tongue is clean. The pulse is regular, of good strength and volume. The heart area is enlarged one finger's breadth to the right of the sternum. The apex is in the fifth interspace, one-half inch to the outer side of the nipple. Over the entire præcordia is heard a blowing systolic and a sharp diastolic murmur, especially over the aortic region. This is transmitted upward and outward into the axilla, and is heard also faintly over the back at the level of the sixth dorsal spine. There is a marked pulsation of the vessels of the right side of the neck, where there can be made out a well-marked expansive thrill and a systolic bruit.

Lungs: Good resonance and respiration over all.

Liver: Dulness from fifth rib to one inch below the costal border.

Spleen: Area not enlarged; edge not felt.

Abdomen: Lax, tympanitic, not tender.

Extremities: There is a well-marked pulsation in the vessels at both elbows and wrists, and also in the posterior tibial artery behind the internal malleoli, especially on the right side. At these places a faint systolic murmur can be made out synchronous with the heart's action. No œdema.

Examination of eyes negative.

Urine: 1016, pale, acid, no sugar, slight trace of albumin. No examination of sediment recorded.

Temperature normal.

From a surgical stand-point aneurisms are of peculiar interest. Broadly speaking, there are two principal ways of curing a local dilatation of a blood-vessel; one by obtaining a clot by external pressure, the other by causing a clot to form in the aneurism by the injection or introduction of materials into the cavity or irritation of the internal wall of the sac to produce a clot. The first method may be divided into pressure by the thumb and fingers, and if it can be carried out for hours may finally produce a clot, organization and obliteration of the sac. There are five methods of treating an aneurism by ligature. First, on the cardiac side at a distance from the tumor; second, on the cardiac side near the tumor; third, on the distal side of the aneurism; fourth, on a distal branch; fifth, proximal and distal ligation of the aneurism itself.

We then come to those things which are used inside the sac to coagulate

the fibrin: chloride of iron has been injected, but has been discarded owing to the danger of embolism; a method which has attracted a good deal of attention is the introduction of wire, through a trocar; this forms a coil inside the sac, and engages the fibrin, producing by its presence a clot; the last method which has been attended by some success is termed "needling," and was introduced by Macewen; a fine, strong, long needle is plunged into the aneurismal sac and the intima is scratched at various places until a mass of fibrin is deposited which gradually obliterates the sac.

Now, we have these different methods of dealing with this aneurism. Its situation fills one with a good deal of thought. A very important question is whether this aneurism involves the common or subclavian, whether it involves both at their junction, or whether it extends down onto the innominate artery. The innominate, so far as I know, has only been ligated eighteen times; of that number sixteen have died, and two only have been successful. The innominate artery, you know, is only one and a half to two inches in length, and its lumen is nearly the size of my thumb. At its origin it is covered by a portion of the vagus nerve and by the left innominate vein; on its right side the pleura and the vagus nerve lie in contact with it. On the left side it has the left carotid artery, and behind the trachea; so, as you can readily appreciate, we have a vessel springing from the aorta, surrounded by extremely important structures.

It is interesting to note the cause of the deaths that have occurred. There have been three things that have killed patients after ligature of the innominate: first, suppuration; second, secondary hemorrhage, and, curiously enough, from the distal end of the vessel which has been tied. All sorts of tendons have been advocated for securing the vessel,—kangaroo, ox-tail, and various round and flat ligatures. If I tie the vessel I shall use a flat silk ligature, and arrange my knot in a flat, square knot, because the deaths from secondary hemorrhage are usually from where the knot has perforated the wall by erosion. The third manner of death has been from shock, which I hope we can avoid.

Now, the operation which has been done in these cases has been the exposure of the lowest part of the carotid and subclavian as they spring from the innominate, by dividing the sterno-cleido-mastoid muscle low down, and insinuating a ligature on the innominate behind the sternum. I do not believe in this kind of surgery; it is surgery in the dark, and is necessarily blind. If I tie the innominate, I shall take out a portion of the sterno-clavicular articulation, in order that I may see plainly what I am doing.

At once there is presented to one's mind the danger of wounding the innominate and the vessels which lie directly between the sternum and the artery. It is not unlike trephining over a lateral sinus. If I wound a vein there will be a profuse hemorrhage, for which reason I propose to expose the upper part of the vessel first and slip a spatula beneath the sternum,

and trephine upon that. If I find an extension of the aneurism downward onto the innominate so that I cannot secure a sound vessel proximally, I shall be forced into ligating the common carotid, subclavian, and probably the vertebral. The first thing to do is to define accurately the position of the aneurism; that can only be done by freely exposing the parts; then we shall have to be guided by circumstances as we go on.

The limits of pulsation in this case can, I think, by close attention, be seen; you can see my fingers rising and falling and the sac pulsating. The first step in the operation is an incision through the skin, from the point where the right carotid divides down to the sternum; a transverse incision is now made outward on the clavicle to the junction of the inner and middle thirds. We come immediately onto the external jugular vein, which is divided. These large veins as they present themselves can be easily controlled by pressure forceps. It is, of course, important to save all the blood that we can, to avoid shock as much as possible, so that as these small veins present themselves it is better to divide and tie them.

Now we come down to the deeper structures of the neck. I will let Dr. Cushing expose the full length of the carotid artery. For a moment let us consider what we are going to accomplish by exposure of the common carotid. The moment we divide the deep cervical fascia and can place our finger on the line of that vessel, we shall be able to determine the upper limit of the aneurismal sac; then, I hope, by raising up the sterno-cleido-mastoid,—certainly by dividing it transversely,—we shall be able to get the external limit of the sac. By careful dissection with the handle of the knife one can expose the vessels in this region with but little risk. It is one of the attractive things in any operation in surgery to accomplish a great deal with but little destruction of important structures. The omo-hyoid now presents itself, and I divide it in order that I may have a freer exposure of the sac. I now have the tumor fairly well exposed, and you can all see it is pulsating strongly. I now make an incision directly upon the inner part of the clavicle, the skin being pulled a little, in order that the flap shall slip up on the neck. This flap of skin is quickly retracted, and now comes the division of the sterno-cleido-mastoid. I will cut the inner part of that muscle first, and if I find it necessary I shall divide the whole of the sterno-cleido-mastoid.

In this operation there is one danger which must be constantly borne in mind,—that is, opening a vein and admitting air to the circulation. For that reason I am going to ask Dr. Cushing to have at hand a sponge with sterile water in it, so that if by accident I should plunge into a vein, he can immediately fill the wound with water. Now we come down to the sterno-thyroid, which is divided and laid back; it readily retracts of itself, owing to the position of the head. Personally I am opposed to the use of a director; it has a sharp point, and it tears structures at times in a most unpleasant way. The accurate division of tissues with a knife is to be preferred.

Here is the sterno-hyoid, which is divided. At times, in looking at an operator, it seems as if one were using a great deal of force in the wound. This should be carefully avoided, for the tearing of tissues should be avoided.

I think, gentlemen, you can identify these structures: here is the carotid artery greatly enlarged; here is the innominate, and this big vein, the internal jugular, puffs back and forth in a most suggestive way, that if it were pricked it would suck in air. Now, the question is whether the subclavian is involved or not. I shall divide these remaining fibres of the sterno-cleido-mastoid which I had hoped to keep, and which it is obviously impossible to save. I have exposed all of the subclavian artery that will be possible; of course, the second part is hidden by the scalenus anticus, and the third part must be practically under my fingers at this minute. I can feel the tubercle of the first rib plainly, and this must be the first part of the vessel, and it is not enlarged. We must find the limit of this sac. It is not going to be possible for me to insinuate my finger beneath the sternum at this point and to define any enlargement of the innominate.

I shall now take out the right sterno-clavicular articulation, so that I can see the lower limit of the aneurism. Dr. Cushing says that it seems as if we were almost at the bottom of the enlargement. I shall feel better when I see the bottom of the enlargement. I will first clear away the structures which lie in the way of taking out the sterno-clavicular articulation. I think a glance at this field of operation demonstrates the number of vessels at the base of the neck. I am going to ligature these vessels, because I don't want them in the way when I come to trephine.

As Dr. Mason has told you, this man has aortic disease as well as this aneurism, for which reason I am constantly apprehensive as to the ether or any struggling which may occur. I think it is more the struggling while going under and coming out of an anæsthetic that we have to fear than the ether itself. Dr. Lovett reports that his condition is excellent, which is encouraging.

Where my forefinger rests is the apex of the sterno-clavicular articulation; this is the sternal notch; here is the first rib; here is the articulation itself. If I can insinuate a broad, flat retractor of copper between the vessels and the sterno-clavicular articulation in trephining, I shall feel safe. I can, however, introduce my finger beneath the sternum, so that I can slide in a spatula, and this will protect the vessels.

I am going to ask Dr. Cushing to do the trephining, because the moment this is completed I shall come down to the innominate artery, and I shall have to delicately use my fingers. The force necessary to do the trephining might make my hand shaky. All we propose doing with this small trephine is to honeycomb this suprasternal notch and the articulation, so that with less force the bone forceps can pluck out and enlarge this notch.

Dr. Bolles asks me a question which is interesting. It is, "How far

does the aneurism extend down?" That is what we are trying to ascertain, and the one important thing is to place our ligature on a part of the vessel which has a sound wall. If we tie through an atheromatous patch the vessel may give way at the time.

I trust you all remember the answer to the old anatomical question, "If you pass a needle through the right sterno-clavicular articulation, what vessels will you injure?" That is exactly the knowledge that is applicable here. I anticipated a good deal of trouble in getting an interspace between the sternum and these vessels, but my finger passes in readily, and it is perfectly clear that we are not going to wound any vessels.

This surgical engine, which I think you have seen used before, is a device of Dr. Bradford, and is a very powerful motor. It is difficult at times to use it on the skull unless you are familiar with the instrument; however, for gross purposes where it is important to rapidly complete an operation, the instrument is invaluable.

This bone is pretty well honeycombed on its anterior surface,—of course I have not touched the posterior surface,—and what I hope is that with the bone forceps we can remove it piecemeal without much force. I could slide one jaw of a pair of forceps under the bone and clip through with a few cuts. This would be a more rapid method, but I am afraid it would injure the structures beneath the sternum. If we should find that the patient were losing strength,—and that is a thing that one should always bear in mind in performing an operation of this kind,—we should be warranted in taking additional risks. I do not think that we shall be driven to removing the bone rapidly with bone forceps, but the time slips by, and the longer this operation goes on the greater danger to the patient. The operation has taken fifty minutes, and it will take twenty more to remove the bone by trephining; therefore, it is better, I believe, to finish the removal of the block of bone by the bone forceps.

My finger is at the extreme tip of the under blade of the forceps; I cannot see how it would be possible to injure any important structures in this way. The block of bone is now out, and the structures posterior to the upper part of the sternum are protruding and must be identified. I believe that I can now expose the sheath of the vessel and the whole of the aneurism, and it does not seem as if it extended down onto the innominate; it feels as if we were going to have a sound space on the vessel proximally.

There has been something occurring in the wound which has filled me with anxiety, and that is the presence of air. The question is where it comes from. The only explanation I can make for it is that we have wounded the pleura, as it comes up near the innominate, but that is not necessarily a fatal complication. I believe I can now apply the ligature, and I think I have reached a point on the vessel that is not diseased. This is very important. The point I have selected is a sufficient distance, I be-

lieve, from the arch of the aorta for the clot to form and organize and not slide into the aorta.

The trouble is now to pass this ligature. Of course, the rule is to pass it away from danger, but here we have danger on both sides, in front and behind the vessel. I see for the first time, or, rather, I feel a vein; it is the left innominate vein as it crosses to join the right innominate. On this side I have the vagus. The tugging back and forth here is very troublesome,—it is the tracheal tugging,—for it is operating "on the fly." It becomes simply a question of patience on my part, and any hurry might prove fatal.

I am now directly inside the sheath of the vessel, so that with a little care on my part, I think I can separate the vessel and pass a needle with less danger than if I attempted to force it through the structures just surrounding the vessel. I am inside the sheath, so that I have no fear of the vagus. I am now trying to slide the sheath off the surface of the vessel. The reason I do not have the aneurismal needle threaded before I pass it is on account of the possible injury to the wall of the vessel; that is the one danger that I am trying to avoid.

I am going to tie the vessel in two places and cut between the ligatures to let up the tracheal tugging. Now I have passed the proximal ligature and am sinking it down towards the arch of the aorta. I am not going to tie a surgeon's knot, but simply a perfectly flat, square knot; the additional twist in the surgeon's knot I am afraid might erode the vessel. Get a big pair of T-forceps, so that, if by accident this should be cut through, we can seize the end. Dr. Munro calls my attention to the fact that probably the pleura is not wounded, but that the bubbling of air is due to the entrance of air into the cellular tissue at the base of the neck. This is a much pleasanter explanation than that of a wound of the pleura.

I think we now have this vessel absolutely tight. Now the thing I would like to do, but am not going to do, is to cut this vessel apart between the ligatures, so as to get rid of the tracheal tug, which must be a constant strain on the vessel, and which I cannot help feeling has something to do with the vessel having given way in so many cases. My reason for not doing it is that the distal ligature is not absolutely tight and I do not think it would be safe.

I have passed and now tie the second proximal ligature. This I do not draw so tight, for I feel the wall of the vessel giving way. Now the pulsation in the aneurism is gone. The sac has collapsed. I have tied about an inch and three-quarters, or perhaps an inch and a half, up from the end of the aorta on the innominate. The pulsation in the arm as well as in the head is gone.

The wound is now closed; the individual muscles have been sutured and the sterno-mastoid and omo-hyoid are replaced. The gap remains in the bone, but it will become obliterated by bone growth.

It is important to superimpose over this aneurismal sac all the solid

structures I can place there, because by that means I prevent the giving way of the sac or vessel and the occurrence of a secondary hemorrhage, which is the one thing that has rendered this operation fatal.

An interesting thing is how the collateral circulation will become established; it will be through the basilar, the aortic, the intercostals, the phrenic, and the epigastric, and through the vessels of the skull, coming down through the face.

[NOTE.—This patient recovered from the operation and was up and about for a number of weeks attending to his affairs. He died, one hundred and four days after the operation, of hypertrophy and dilatation of the heart and general arterial sclerosis. The innominate artery was closed and the aneurism was shrunken.]

REVIEW OF MEDICINE.

MEDICINE.

IN CHARGE OF JOHN H. MUSSER, M.D.,
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Endocarditis following Gonorrhœa. (*Deutsche Archiv für klinische Medicin*, vol. lvi., Nos. 3 and 4, 1895.) By Dauber and Borst.

Twenty days after the appearance of a gonorrhœal discharge the patient had a chill with rise of temperature. Under the influence of salicylates the fever assumed that of a mild remittent form. Six weeks later another chill occurred followed by hectic fever and the symptoms of aortic insufficiency. The patient died four weeks after this. The urethral secretion had shown only gonococci at first, later it had become purulent, with disappearance of these and the appearance of the pyogenic bacteria. Cultures of the blood during life had been without result. Sections of the indurated valve showed small biscuit-shaped, non-capsulated diplococci, that decolorized readily by Gram's method. A culture of the heart's blood, however, upon human serum agar, exhibited, after thirty-six hours in the incubator, isolated punctiform round colonies that were of a yellowish-brown color and translucent. These under magnification showed sharp edges without budding, and contained diplococci in all respects similar to those found in the aortic valves. From the character of the cultures they were declared to have no relation to gonococci. The kidneys presented the usual lesions

found in septicæmia,—that is, those of acute interstitial nephritis, and some infarcts.

The writers do not deny, although they doubt, that the gonococcus can produce valvular lesions of the heart, but they lay stress upon the impossibility of making a positive diagnosis from the form and shape of the bacteria alone. In the present case they believe that the septic condition proceeded from the secondary infection of the urethra.

Hemianopsia in Uræmia. (*Deutsche Archiv für klinische Medicin*, vol. lvi., Nos. 1 and 2, 1895.) By Friedel Pick, M.D.

The author reports a case of uræmia with ocular symptoms. An acute exacerbation occurred in a case of chronic nephritis. Blindness came on suddenly in the course of the acute uræmic symptoms. At first the pupils were immobile, later they reacted well, and on the following day were fixed in myosis. The eye-grounds were negative. Examination now showed the existence of an homonymous hemianopsia sinistra. The autopsy showed an area of softening in the second occipital lobe on the right side. The ependyma was thickened and the ventricles dilated. The kidneys showed the changes of chronic interstitial nephritis. Pick concludes that the amaurosis was uræmic, and the hemianopsia the result of the area of softening. This latter was shown to be embolic. In considering this case, in connection with some others in which a transient amaurosis had completely disappeared, he discusses the theory of Traube, that uræmic amaurosis is due to the mechanical effects of œdema; and that of Rosenstein, that it is the result of the action of toxic substances, retained in the blood, upon the capillaries of the brain, producing local anæmias and possibly softening. He finally concludes that an actual lesion of the brain substance may occur in uræmia, from the fact that permanent lesions of vision do take place, and further, that permanent softenings, with their attendant focal symptoms as a direct result of uræmia, are not impossible.

The Function of the Suprarenal Capsules. (*Wiener medicinische Wochenschrift*, No. 6, 1896.) By N. Cybulski, M.D.

Under the direction of the author, Dr. Szymonowicz commenced a systematic series of experiments. The removal of one suprarenal had no effect; if, then, the second were also extirpated the animal died within ten hours. The prelethal symptoms were apathy and stiffness of the muscles, a reflex muscular contraction occurring at each attempt at movement. At last the animal lay upon its side and breathed very deeply and heavily. Erythrocytes and hæmoglobin were greatly increased. The temperature showed very slight variations. The blood-pressure sank to zero just before death. One cubic centimetre of an aqueous extract of suprarenal body (one part suprarenal, ten parts water) caused complete restoration for half an hour or more. One cubic centimetre of the ten-per-cent. solution injected into a normal animal caused great increase of blood-pressure, far exceeding the physiological

limit, slowing of the pulse-rate, and increase of the respiratory rate. Sometimes, in small animals, there was primary increase of the pulse-rate, due, the author thinks, to temporary paralysis of the vagus centre. By section of the spinal cord and the vagi the action was determined to be upon the centre of the medulla, and entirely of a stimulant character. It was further determined that an extract of the medullary portion of the gland was twice as strong as an extract of the cortex. By its action in various solutions Cybulski believes that the active principle is of the nature of a base.

Estimation of the Leucocytes in the Urine and their Value in Diagnosis. (*Berliner klinische Wochenschrift*, December, 1895.) By Karl Reinecke, M.D.

In the cases examined the number varied from fourteen hundred to one hundred and fifty thousand pro cubic centimetres. The method employed was to place a drop of urine, after thorough shaking, upon the Thoma-Zeiss slide, and count as if a mixture of blood. If more than forty thousand pro cubic centimetres were present, a three-per-cent. solution of sodium chloride was used for diluting. The importance of the procedure lies in the possibility of the recognition of nephritis when pus and albuminuria are both present. About one hundred thousand pus cells pro cubic centimetres cause one per cent. of albumin in the urine. The two chief sources of error are imperfect mixing and the presence of mucus, holding the corpuscles in clumps. In ammoniacal urine the results cannot be trusted. Aside from the determination or exclusion of the presence of nephritis in cases of pyelitis and cystitis, the method is useful in order to ascertain the effect of treatment and the course of the disease.

The Diagnosis of Changes in the Size, Position, and Motility of the Stomach in Cases where Intragastric Instruments cannot be used. (*Medical News*, January 18, 1896.) By Boardman Reed, M.D., of Atlantic City, N. J.

In cases where, for any reason, the introduction of the tube into the stomach is not permitted, the physical examination by the combined use of clapotement and percussion gives satisfactory results. If in any case clapotement and percussion do not agree in their testimony, we should be guided by the latter as being less likely to deceive. It is best to examine the patient at a time when the stomach should be entirely empty. Examine the patient first by clapotement and then map out the boundaries by percussion, at first in the recumbent and then in the standing or sitting posture. Then have the patient drink an eighth or a quarter of a litre of water and repeat the processes. By this combination of methods the following kinds of stomachs can be differentiated: First, a stomach of normal size, in normal position, and having sufficient motor power. Second, a stomach normal as to size and position, but weak in motility, gastric atony. Third, an enlarged stomach with strong motor power, the megalogastrie

of Ewald. Fourth, an enlarged stomach with weak motility, dilatation, or gastrectasia. Fifth, a stomach wholly displaced downward, but otherwise normal, not enlarged, the gastroptosis of Glenard. Sixth, a stomach both enlarged and displaced downward as a whole, but not dilated ; motility good, megalogastrie with gastroptosis. Seventh, a stomach wholly displaced downward and dilated, weak motility, gastroptosis with gastrectasia. Eighth, the pyloric end of the stomach displaced downward and swung around to the left, but without dilatation. Often the pylorus is carried down almost, if not quite, into the long axis of the fundus, producing what is called the vertical or subvertical stomach, according to the degree of the displacement. This form may be appropriately called pyloroptosis. Ninth, the pyloric end of the stomach displaced, as in the previous variety, and also dilated, pyloroptosis with dilatation. In the normal stomach no splash will be obtainable until after the viscus has been partly filled, and then either none or a feeble one, heard not lower, as a rule, than midway between the lower end of the sternum and the umbilicus. Percussion, especially with the patient standing after drinking water, will demonstrate the boundaries in normal place. In the atonic stomach the splash may possibly be heard four to six hours or longer after a full meal, or, if not, the drinking of a very small quantity of water will develop it decidedly. Percussion will show delayed emptying of the organ. In megalogastrie the upper border of the viscus will be found in the normal situation, the lower border may be at the level of the umbilicus or even below, but the motility is good. No splash obtainable six hours or longer after a full meal. In gastrectasia the splash is usually obtainable six hours or longer after a meal, and in bad cases at any time during the twenty-four hours. Percussion shows enlargement of the organ and delay in emptying itself. In gastroptosis the splash is rather more easily obtainable than in the normal condition and at a lower level, often at the umbilicus or even below it. Percussion shows descent of both upper and lower boundaries, but no enlargement. In pyloroptosis the splash is obtained usually far below the level of the normal lower border. Percussion reveals the peculiar outlines of the vertical stomach with the pyloric end low in the abdominal cavity. In the combined conditions, megalogastrie with gastroptosis, gastroptosis with gastrectasia, and pyloroptosis with dilatation, the signs of the first condition will have added to them the signs of the complicating state of affairs.

Laryngeal Paralyses in Typhoid Fever. (*Annales des Maladies de l'Oreille,* April, 1895.) By W. Lublinski, M.D.

The author has observed five cases of laryngeal lesion in the course of or on the decline of typhoid fever. Four of these cases were observed in the male. The laryngeal troubles have shown themselves after the defervescence in four cases. In the most of the cases nervous lesions are at work. Paralysis of the dilators was observed once, paralysis of one recurrent laryngeal nerve was observed three times, and paralysis of both recurrent

laryngeal nerves was observed once. He concludes that it is certain that our knowledge of this question is not very extensive, and it is impossible to estimate the frequency of this complication in typhoid fever, since systematic laryngoscopic examinations are not made in the course of the disease. —*Revue hebdomadaire de Laryngologie, d'Otologie, et de Rhinologie*, January 4, 1896.

The Nauheim (Schott) Treatment of Heart-Disease. (*Birmingham Medical Review*, December, 1895.) By Robert Saundby, M.D.

The beneficial effects of the Nauheim baths in the treatment of chronic cardiac disease were first proclaimed by the late Professor Beneke, about 1872. A few years afterwards monographs from the pens of Drs. August and Theodor Schott reinforced his teachings, and the treatment gained considerable repute in Germany.

The medicinal waters of Nauheim are derived from twelve springs, of which four are used for drinking and three for the baths. The course begins with a one-per-cent. salt bath at 95° F., and as time goes on the amount of solids may be gradually increased, the temperature lowered to 85.5°, and the time of immersion increased to twenty or thirty minutes. Later on the baths contain the water charged with carbonic acid gas, and, finally, in suitable cases, the "Strombad" with its continuous rush of foaming water is permitted. The immediate effects of the bath are to reduce the rate of the pulse and to increase its force and tension; at the same time the area of cardiac dulness retracts in all directions.

The success obtained by the Zander movement cure induced Dr. A. Schott to devise a system of mild gymnastics for the treatment of neurasthenia and hysterical patients. These exercises were found to slow and steady the heart's action instead of quickening it; and this method, originally devised for steadying the nervous system, proved to be a valuable adjunct to the bath treatment of cardiac disease. The exercises are called "Widerstandsgymnastik," or resistance gymnastics, and consist of slow movements executed by the patient and resisted by the operator, who should oppose with his hand held flatly and so lightly that the patient always feels himself easily the master. These exercises are nineteen in number,—

1. Arms extended in front of body on a level with shoulder, hands meeting; arms carried out until in line, and brought back to original position.

2. Arms hanging at sides, palms forward; arm flexed at elbow until tips of fingers touch shoulder, back to original position; one arm only moved at a time.

3. Arms down, palms forward, arms carried outward and upward until thumbs meet over head; back to original position.

4. Hands in front of abdomen, fingers flexed so that second phalanges touch those of opposite hand; arms raised until hands rest on top of head; back to original position.

5. Arms down, palms against thighs, arms raised in parallel planes as high as possible; back to original position.

6. Trunk flexed on hips; return to original position.

7. Trunk rotated to left, to right; return to original position.

8. Trunk flexed laterally.

9. As No. 1, but fists clinched.

10. As No. 2, but fists clinched.

11. Arms down, palms against thighs, each in turn raised forward and upward until arm is along-side of ear, then turned outward, and arm descends backward.

12. Arms down, palms to thighs, both together moved backward in parallel planes as far as possible without bending the trunk forward.

13. Thighs in turn flexed on trunk, opposite hand resting on chair.

14. Lower extremities in turn extended fully, and bent on trunk forward and backward to extreme limits of movement, opposite hand resting on chair.

15. Legs in turn flexed on thigh, both hands on chair.

16. Feet together, lower extremities in turn abducted as far as possible, and brought back to original position, opposite hand on chair.

17. The arms, extended horizontally outward, are rotated from the shoulder-joint to the extreme limits forward and backward.

18. The hands in turn are extended and flexed on the forearm to extreme limits, and brought back in line with arm.

19. The feet in turn are flexed and extended to extreme limits, and then brought back to their natural position.

The effects of the exercises are the same as those of the baths. The system is claimed by Dr. Schott to be of special value in all cases of chronic heart-disease except where there is advanced degeneration of the myocardium, or aneurism of the heart or great vessels, or advanced arterio-sclerosis. It has proved of great service in all forms of valvular disease, in congenital cardiac defects, in simple dilated hearts, in the functional cardiac debility of anæmia, in nervous irritable hearts, in simple tachycardia, and in the rapid heart of Graves's disease.

The theory adopted by Dr. Schott is that the baths and the exercises act upon the heart through the nervous system by evoking a reflex influence which stimulates the action of the cardio-inhibitory or regulator nerves, thus slowing and strengthening the pulse. Dr. Bezly Thorne, who has published an admirable hand-book which explains the system very clearly, believes that the baths and exercises alike favor the circulation by dilating first the muscular arteries and afterwards those of the skin, and thus relieve the heart from backward pressure. The theory of Dr. Thorne is not consistent with the pulse-tracings and manometric observations of Dr Schott, nor with the physiological law that the heart beats vary inversely with the blood-pressure.

In the writer's opinion the beneficial results of the Schott system

depend upon the very careful and easily regulated method by which the extra work is imposed upon the muscular wall of the heart, which is thereby developed and strengthened by systematic graduated exercises.

Case of Dissecting Aneurism of the Aorta; Rupture into the Pericardium. (*British Medical Journal*, February 15, 1896.) By H. S. Elworthy, M.D.

The case had suffered from abdominal pains of obscure causation for some time. He suddenly began to complain of severe pain in the abdomen, shooting into the throat and arms. There was numbness of the arms, paralysis of the legs, and collapse; death occurred twelve hours after the onset of the acute symptoms. The autopsy showed transverse rupture of the inner and middle coats of the ascending aorta. The external coat was dissected as far as an inch into the left external iliac, the lumen of the aorta itself being almost obliterated by pressure. The external coat had ruptured by a vertical slit into the pericardium. No clinical history of the symptoms presented by the heart is given, nor was the real condition suspected.

Affections of the Skin occurring in the Course of Bright's Disease. (*British Medical Journal*, November 30, 1895.) By P. H. Pye Smith, M.D.

Besides erythema læve, four forms of affections of the skin, occurring in Bright's disease, are described,—

1. A bright-red, diffuse papular eruption, similar to that caused by sweating, but without sudamina.

2. A papular eruption, with large discrete, rather dark-red pimples seated on a dry, rough, and sometimes scaly skin.

3. A moist dermatitis, occurring on the legs and arms, but not affecting the flexures of the joints, and without irritation.

4. An extensive and diffuse dermatitis resembling dermatitis exfoliativa.

All these are superficial, leaving no trace after death. They are never pustular, rarely purpuric, and they are associated with slight, if any, subjective symptoms. Usually they appear late in the course of the disease, but they do not indicate any aggravation of the renal symptoms. The author does not believe that the renal disease has a more direct causal connection than that it exerts in the production of the more common inflammatory conditions of the serous membranes.

Two Cases of Chromidrosis. (*Lancet*, February 15, 1896.) By F. W. A. Scott, M.D.

The patients, father and son, working in the same place, noticed that their linen was stained a pink color, more marked where it came in contact with the neck, wrists, and scrotum. The skin itself was apparently perfectly normal. Cultures, however, developed a pink growth, and the organism was found to be a torula. The author believes that some peculiar condition of the skin is necessary for its development.

The Question of Leucocytosis in Tuberculous Processes. (*Deutsche Archiv für klinische Medicin*, vol. lvi., Nos. 3 and 4, 1895.) Stein and Erbmann.

Having first reviewed briefly the literature and shown the very contradictory opinions held by different authorities, the authors describe a modification of the latest method suggested by Thoma for the estimation of the number of leucocytes. This method is admirable and deserves to be given *in extenso*. The slide having been prepared in the usual manner and focussed under the microscope, the draw-tube is moved up and down, until the edges of the field of vision exactly include a square of a definite side length $= s$. Then the area of the square is to the area of the circle as $S^2 : r^2 \times \pi$; or as $2r^2 = S^2$, then the ratio is $S^2 : \frac{S^2 \times \pi}{2}$, or $2 : \pi$. The area of the included square, therefore, equals $\frac{2}{\pi}$ times the area of the circle. If this contain a unit of small squares, then each of these equals $\frac{1}{a}$ part of the large square, and the area of the circle in these units equals $\frac{2}{\pi \times a}$. It requires four thousand of these to contain one cubic millimetre of liquid, therefore, to estimate the number of corpuscles in this body of liquid, Z the number counted must be multiplied by twice four thousand times the dilution (d) and divided by $\pi \times a$ times the number of fields counted (m), or $x = \frac{Z \times 2 \times 4000 \times d}{\pi \times a \times m}$. A dilution of 1 : 10 is recommended, and the counting of twenty-five fields giving a constant formula $\frac{Z \times 80{,}000}{\pi \times a \times 25}$, or $\frac{Z \times 3200}{\pi \times a}$. Tables are now given for fields containing twenty-five, thirty-six, and sixty-four small squares. The use of tables is, of course, a disadvantage at first, but even without them the calculation is but slightly more complicated than that of the ordinary method, and the fact that all the corpuscles in a field are counted without regard to the lines, after the field has been set, is a great relief to the eyes.

By this method, making several mixes from each case for greater accuracy, a number of cases were examined, and from the results obtained certain conclusions drawn. The counts were always made at 11 A.M., four and a half hours after the ingestion of food. In ten cases of commencing tuberculosis the number of leucocytes was normal, ranging from two thousand five hundred to nine thousand. In ten cases of advanced pulmonary tuberculosis without the formation of cavities or extension beyond the apices the result was the same. In five of seven cases of hæmoptysis, a leucocytosis ranging from twelve thousand to twenty thousand existed during or immediately after the hemorrhages. In two, despite severe hæmoptysis, the white blood cells were not increased. There now follows a tabulation

of forty cases in which the tuberculous process was either advanced or increased very considerably during the observation. The results of the autopsies are recorded in a number of the cases.

The authors now consider the results of their investigations, and conclude that the leucocytosis occurring after hæmoptysis cannot be distinguished from ordinary post-hemorrhagic leucocytosis. This, they believe, is due to the stimulation of the lymphatic glands by anæmia, and urge in confirmation of their theory the fact that the leucocytes were chiefly large (?) and small lymphocytes. They also call attention to what they call the peculiar functional activity in the lymphatic system in tuberculosis.

The forty tabulated cases are now critically considered. Of these, five presented slight, if any, increase in the number of leucocytes; all were cases of chronic pulmonary tuberculosis, extremely emaciated, with fatty degeneration of the organs, and either no cavities or very small ones. Thirteen cases had moderate leucocytosis, reaching twenty thousand. In these there were few or no cavities, but usually other conditions existed, such as anæmia, lymphadenitis, pleurisy, or pneumothorax, sufficient of itself to account for the increase in the number of white blood cells. A number of cases of rapid development with large cavities, or tuberculosis of other organs, had a marked leucocytosis, reaching from thirty thousand to sixty thousand. One case had fibro-purulent peritonitis, another caries of the vertebræ, and in others other secondary conditions existed.

From this analysis they conclude that leucocytosis occurs under the following conditions:

1. When extensive cavities exist.
2. During inflammatory processes occurring just before death.
3. In chronic suppuration resulting from carious processes.
4. In hyperplasia of the lymphatic glands, even when the pulmonary process has not led to extensive destruction of tissue.

The possibility that the leucocytosis is due to infection by staphylococci or streptococci is discussed, and the virulence of many of the forms found in phthisical lungs offered as an argument in favor of this view; but as the investigations showed that when, in a case with cavities, the process ceased to advance, the number of leucocytes diminished, and when the destruction of lung-tissue was rapid, it increased, the authors conclude that "the leucocytosis is not merely the result of a mixed infection, but corresponds to a secondary infection proceeding from the cavities, and to a chronic septicæmic fever."

Destruction of tissue, therefore, is the immediate course of leucocytosis, as thereby pus cells and leucocytes are absorbed into the blood channels, and increase of the number of the white elements occurs.

And further that the number of leucocytes is normal,—

1. In beginning phthisis.
2. In advanced cases limited to the apices or, at least, without cavities.

3. In cases of chronic infiltrating tuberculosis with little or no destruction.

4. And that it is slightly increased after hæmoptysis.

The inferences to be drawn clinically are,—

(*a*) Increase of the number of leucocytes in cases in which no suppurative or exudative process exists is evidence of destructive action.

(*b*) A sudden increase indicates the beginning of a distinctive process.

(*c*) A normal number of leucocytes excludes cavity or destructive process.

THERAPEUTICS.

IN CHARGE OF ALEXANDER D. BLACKADER, B.A., M.D.,
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ASSISTED BY
D. J. EVANS, M.D.

Mortality from Diphtheria since the Use of Serum. (*Progrès Médical*, December 21, 1895.) By M. H. Monod, M.D.

In one hundred and eight towns in France, comprising more than twenty thousand inhabitants, the mean mortality from diphtheria during the first six months of the years 1888 to 1894 was two thousand six hundred and twenty-seven. During the first six months of 1895 there have only been nine hundred and four deaths, a decrease of 65.6 per cent. If one considers that diphtheria is more frequent in the country than in the towns, one ought to consider at least fifteen thousand lives saved each year.

The Action of Alcohol on Digestion. (*Progrès Médical*, December 21, 1895.) By M. P. Haan, M.D.

The author presented the results of his experimental research on this subject to the *Société de Biologie*. He concludes that in small doses alcohol stimulates the stomach, and consequently promotes hyperchlorhydria and hyperacidity of that organ. In large doses it loses its stimulant action, and the chlorhydric action upon albuminoids is either weak or wanting.

Treatment of Diabetes by the Ingestion of Pancreas. (*Wiener medicinische Blätter*, 1895.) By M. Borman, M.D.

The author reports the case of a man, aged thirty, who came to the hospital complaining of general weakness, polyuria, various pains, cough, etc. He had the appearance of a consumptive, but tubercle bacilli could not be found in the expectoration. He voided three thousand five hundred grammes of urine, which contained a high proportion of sugar (dextrose): four hundred grammes in twenty-four hours. The case was of the type of wasting diabetes, and the glycosuria had been present a long time, as was proved by an old furunculosis and troubles of vision. Under the influence

of appropriate diet the polyuria and glycosuria improved; the daily quantity of sugar fluctuating between thirty and one hundred and ten grammes; the weight was not much changed.

About the 5th of April the patient was given one roasted ox-pancreas. The sugar fluctuated between seventeen and forty grammes. After a time the patient refused to continue this food. Then, in experimenting with the gland, he took the juice of a half pancreas by the stomach-tube; the sugar fell to fourteen grammes, but increased shortly to thirty grammes, at which figure it remained until about the 20th of April, when the patient was given a daily injection of one centimetre and a half of extract of pancreas. The patient left the hospital May 9, considering himself very much improved; and, in fact, he was really stronger. He suffered less from thirst and his polyuria was less. Finally, during his stay at the hospital he had increased more than four kilogrammes in weight.—*Gazette Médicale de Liège*, January 9, 1896.

A Case of Tetanus, following Abortion, treated by Antitoxin; Recovery. (*Boston Medical and Surgical Journal*, January 16, 1896.) By Charles T. Withington, M.D., of Boston.

The author reports a case of tetanus following abortion which was claimed to be non-instrumental. Three days after the abortion there were signs of puerperal sepsis and the uterus was curetted, and three days later symptoms of tetanus appeared.

The patient had frequently recurring spasms, averaging from ten to twenty an hour. She was treated at first by large doses of bromide of sodium and chloral, and later with tetanus antitoxin-serum. She received, on three successive days, twenty-two cubic centimetres, twenty-three cubic centimetres, and twenty-three cubic centimetres respectively. This treatment relieved the spasms, the occurrence of the spasmodic movements falling from one hundred and twenty in nine hours to thirty-five in eleven hours. The bromides and chloral were reduced in amount when the first injection of serum was given, and discontinued entirely at the time of administering the third dose. Three days after the third administration of the serum the spasms were on the increase, and the patient received a fourth injection of twenty-two cubic centimetres of serum. Improvement was then constant, and the patient was discharged cured in about two months' time, menstruation being established before she left the hospital. At the time of the fourth dose of the serum the patient was given a single dose of fifteen grains of chloral.

Some New Drugs,—Apocodeinum Hydrochloricum, Arecolinum Hydrobromicum, Argentamin, Argonin, Bismuthum Betanaphtolicum, Bryonine, Calcium Permanganicum, Magnesium Permanganicum, Calcium Sulphophenylicum, Calcium Sulphuratum, Canadinum Hydrochloricum. (Collected largely from *Merck's Berichte* and abstracted in the *Therapeutische Wochensehrift*, February 16, 1896.)

Apocodeinum Hydrochloricum.—Different opinions prevail in regard to the pharmacodynamic effect of apocodeine, and persist to-day, in spite of two researches of recent date. While Murrel attributes to the drug a purely expectorating effect, Guinard is of the opinion that apocodeine acts principally as a sedative, but increases at the same time the salivary secretion and the peristalsis of the bowels. G. Meder, in his recent essay ("Inaugural Dissertation," Dorpat, 1895), supports Murrel's view, and asserts emphatically that apocodeine has practically only the value of an expectorant. On the contrary, Toy's (*Therapeutische Wochenschrift*, 1895, p. 875) reports agree with Guinard's researches, in that the application of this medicament in maniacal conditions is always followed by tranquillity and ease of mind, sometimes by a sleep of several hours' duration. The administration *per os*, as well as by subcutaneous injection, gives rise to intestinal peristalsis, and produces always one and sometimes even two to three evacuations. The sedative dose is from two to six centigrammes, whether given subcutaneously or internally.

For internal administration :

℞ Apocodeini hydrochlorici, 0.5 ;
Aquæ destillatæ, 100 ;
Syrupi rubi idæi, 25. M.
Sig.—One-half to one teaspoonful at a dose.

Or subcutaneously :

℞ Apocodeini hydrochlorici, 0.2 ;
Aquæ destillatæ, 10. M.
Sig.—One Pravaz syringeful at a dose.

Arecolinum Hydrobromicum.—New experiments with arecolinum seem to indicate that we have gained in this drug a substitute for physostigmine. After Fröhner and others had recommended the utilization of the sialagogic and laxative action of arecoline for its laxative effect in the constipative colic of horses, Lavigna, of Turin, employed the alkaloid as a myotic. Instillation of a drop of a one-per-cent. solution of the arecolinum hydrobromicum is recommended. A well-marked myosis occurs in five minutes, which reaches its maximum after ten minutes, and persists for thirty minutes. After seventy minutes the pupil is reduced again to its normal size. The maximum myosis obtainable by arecolinum is found in a pupil-diameter of one and a half millimetres. The repeated application of this remedy in the above-mentioned dose, within a day's time, never produces headache. Lavigna therefore believes arecolinum is a myotic well worth consideration, as its effect is very rapid ; and, on the other hand, it produces well-pronounced dilatation of the pupil that does not persist over an uncontrollable time.

The following solution commends itself in ophthalmological practice :

℞ Arecolini hydrobromici, 0.1;
Aquæ destillatæ, 10. M.
Sig.—Eye-drops for producing myosis.

Regarding the physiological effects of arecoline, Battistini and Scofone have recently made researches, and have proved that in frogs it produces first an exaggeration of the reflexes and spasms, and, after very large doses, paralysis. In the warm-blooded animals myosis, salivation, diarrhœa, paralysis of the heart and of the respiration set in. Arecolinum produces diastolic arrest in frogs, which may be removed by the administration of atropine. The curve of contraction of the muscles is not essentially changed, but the curve of fatigue shows a well-marked increase of the exertion of the muscles. The application of arecolinum as a tænifuge in place of aracanis-nut was recommended by Bardet at a meeting of the Parisian Therapeutic Society held October 23 of last year. Pouget replied that its disagreeable effect upon the heart in animals might limit its application in man. If its accompanying effects are really to be ascribed to arecolinum, and not to impurities of the drug, it would be advisable to consider if the less poisonous ethyl ether of arecaidine, which is termed homarecolin ($C_7H_{10}(C_2H_5)NO_2$), should not be employed in its stead.

Argentamin.—The gonococci-destroying effects of argentamin observed by Schäffer were verified in the course of the past year by the examinations of A. Aschner (*Therapeutische Wochenschrift*, 1895, p. 464) and of Albertazzi. Aschner recommends that injection of the whole urethra be made with a solution in the strength of 1 : 1000 and 1 : 250. For anterior urethra, which is more sensitive, solutions of 1 : 2000 and 1 : 1000 are recommended. Both experimenters agree in praising the penetrating effect of this drug, on account of which the remedy is more able to reach and kill the gonococci hidden in the folds of the mucous membrane than any of the usual antigonorrhœics. The first days of the treatment, especially after the use of the concentrated solutions, the gonorrhœal discharge is somewhat increased, but decreases rapidly in the course of a few days.

℞ Argentamini, 0.05–0.1 or 0.2–0.4;
Aquæ destillatæ, 100.
Sig.—For injection.

Argonin.—This drug is produced by chemical replacement of sodium caseïn with argentum nitricum. The resulting caseïn-silver combination, which is soluble in warm water, forms in a dry condition a colorless powder. In order to dissolve argonin, one moistens carefully the minute particles of the substance, in a mortar or in an evaporation dish, with cold water, until it is fully moistened. Then it is put into a water-bath and heated and stirred until the solution is complete. Insoluble portions are removed by filtration. Argonin solutions, which may be prepared up to the strength of ten per cent., do not keep very long, and must be kept well protected against light. Fifteen grammes of argonin contain as much silver

as one gramme of silver nitrate. The researches of A. Liebrecht, R. Meyer, and J. Jadassohn have revealed that argonin as well as silver nitrate has antibacterial qualities, but is distinguished from the latter drug by its non-caustic effect. The disinfective power of the remedy shows itself especially against the gonococci. If argonin is mixed with ammonia by an attenuation of 1 part of argonin to 30,000 parts of nutrient agar, the growth of the gonococci is stopped after five minutes. A solution of one to two per cent. of argonin was tried by Jadassohn in the treatment of acute gonorrhœa of the anterior and posterior urethra of a man, and the urethra and uterus of a woman, with the best results. As the preparation does not seem to have astringent qualities, it is advisable to use other remedies in treating catarrhal affections.

℞ Argonini, 1.5–2;
Solve lege artis in aquæ destillatæ, 100;
Detur ad vitrum nigrum.
Sig.—For injection.

Bismuth Betanaphtolicum.—According to H. Engell, betanaphthol bismuth, which was recommended by Schubenko and Jasenski as a disinfectant of the bowels, is indeed a reliable remedy in all more or less intense alterations of the functions of the intestinal canal, surpassing all other known bismuth preparations. Its administration is especially indicated if the assumption of auto-intoxication from the bowels is tenable. Betanaphtol bismuth may be given without danger for a long time, even to children, in doses of 0.25 to 0.5 gramme three times daily. In adults this amount is doubled.

℞ Bismuthi betanaphtolici, 3;
Pulv. gum. arab., 0.5;
Mucilag. g. arab., q. s.
Misce f. mass. pil. No. 30.
Obduc lege artis salolo.
Sig.—Two to five pills three times daily. (To be used in acute intestinal catarrh.)

℞ Bismuthi betanaphtolici, 0.3;
Da ad chartam japonicam tales.
Doses No. 20.
Sig.—One powder three times daily in catarrh of the stomach. It is best to give children in the above-mentioned prescription 0.03 gramme for every year of life, as recommended by Chaumier.

Bryonine ($C_{18}H_{30}O_9$).—Bryonine is found with bryonidine in radix bryoniæ albæ. It is a glucoside and forms a yellow, very bitter-tasting amorphous powder, which is easily soluble in water and alcohol. To prevent decomposition it is necessary to preserve the preparation in a dry place, well corked. According to the researches of J. M. Shaller, bryonine has an irritating effect upon the mucous membrane of the stomach. In a sufficiently large dose bryonine is a very efficient cathartic, and also exer-

cises some influence upon the activity of the kidneys, increasing the amount of urine voided. Its administration is therefore indicated in all cases of dropsy and in congestive conditions of the liver. It also has a beneficial effect in annoying conditions of some other diseases, as in headache after meningitis, pains in the side after pleurisy, in præcordial attacks of pericarditis, and in pains of chronic articular rheumatism. Bryonine is especially indicated in all chronic inflammatory conditions of the serous membranes. Bryonine is best prescribed in the form of granules, each of which contains one milligramme of the drug. One granule is given every two hours until sufficient evacuation of the bowels is obtained, while later on one granule twice or three times a day is sufficient. In vigorous patients suffering from habitual constipation these doses may be increased in the ratio of one to two granules a dose. In a weak patient the dose should be proportionately decreased.

℞ Bryonini, 0.1;
Sacchari lactis, 4;
Gummi arabici, 1;
Syrupi simplic. q. s. ut f. massa e qua formentur granula No. 100.
Sig.—One granule every two hours.

Calcium Permanganicum, $Ca(MnO_4)_2 + 5H_2O$.—Calcium permanganicum resembles in its appearance potassium permanganate. It is, however, less distinctly crystalline. In water it is very easily soluble. According to Bordas (Parisian Academy of Medicine, June 26, 1895), we are likely to possess in this remedy an ideal antiseptic, surpassing even the bichloride of mercury. As further advantages of the permanganate are to be mentioned the fact of the absence of toxic or caustic effect. The calcium permanganicum has a hundred times stronger antiseptic effect than the potassium salt, because the drug is decomposed when brought in contact with organic matter, even in the cold, the final products being oxygen, manganese oxide, and calcium oxide. For this reason Bordas and Girard recommend calcium permanganate in place of the potassium salt for the purification of drinking water. In order to remove the surplus of calcium permanganate and to discolor the water, the lower oxides of manganese are supplied, in order to reduce the permanganate and transform it into manganese dioxide. The water treated with calcium permanganate is free from organic matter and microorganisms, and contains, along with a small amount of carbonate, traces of oxygenated water, which again help to keep the water free from contamination. Experiments to utilize the antiseptic power of calcium permanganicum in practical medicine have been already begun, and when completed may give satisfactory results.

Magnesium Permanganicum.—Merck has prepared in the course of the past year, while investigating the soluble permanganate preparations, magnesium permanganicum, $Mg(MnO_4)_3 + 6H_2O$, which very likely might have the same oxidizing power as the corresponding calcium salt.

It consists of granular bluish-black crystals which are easily soluble in water.

Calcium Sulphophenylicum, $Ca(C_6H_5SO_4)_2$.—This is a white, astringent, bitter-tasting powder, nearly odorless, soluble in water and alcohol. G. Tarozzi in the past year called attention to the application of magnesium sulphophenylicum, and also recommends the calcium salt as an excellent antiseptic and astringent in all cases in which a cicatricial union of certain external or internal lesions is desired. The remedy is given in the following formula:

℞ Calcii sulphophenylici, 2;
Aquæ destillatæ, 150;
Syrupi rubi idæi, 50.
Sig.—One teaspoonful every two or three hours.

Calcium Sulphuratum, CaS.—This drug is a grayish-white powder. W. E. Green observed that all of his patients who had taken this drug have been immune from influenza, and he therefore believes that the preparation is a prophylactic against this disease. The immunity is established after three days' use of a dose of 0.06 gramme of the remedy. Quinine sulphate has a much less energetic prophylactic action than calcium sulphide; but a dose of 0.3 gramme of the former preparation is more efficacious if the influenza has already set in.

℞ Calcii sulphurati, 2;
Terræ siliceæ, 0.3;
Mucilag. g. tragacanth., q.s. ut f. pil. No. 30.
Obduc solution e gum. sandaracæ.
Dentur ad vitrum.
Sig.—Several pills to be taken on an empty stomach daily.

Canadinum Hydrochloricum, $(C_{20}H_{21}NO_4HCl)$.—This drug appears in small colorless crystals, which become yellow in time, and are soluble with difficulty in water. The alkaloid canadine is found along with berberine and hydrastine in the root of the hydrastis canadensis. Large doses of canadine produce in warm-blooded animals psychic and motor signs of irritation, which last a short time, and are followed by cerebral and spinal paralysis (von Bunge). Canadine, furthermore, produces intense peristaltic movements of the bowels and diarrhœa. The drug does not exercise any influence upon the uterus, but has a poisonous effect upon the fœtus, which is irritated to violent movements, while at the same time the uterus is motionless. Blood-pressure is not affected by canadine as it is by hydrastine. Canadine, therefore, does not share the healing properties of hydrastis extract in hemorrhages of the uterus. Small doses do not affect the heart in a typical way; large doses produce arhythm. A fatal dose for cats, if inoculated by intravenous injection, is 0.2 to 0.25 gramme per kilo of the body-weight. Death occurs through paralysis of the respiratory centre. The smaller portion of the canadine leaves the body through the intestine

unchanged; the larger part becomes disintegrated in the organism, one of the final products, oxalic acid, being excreted with the urine.

Acetanilid-Poisoning in Babes due to its External Application. (*Journal of the American Medical Association*, February 1, 1896.)—Charles W. Rook, M.D., of Quincy, Ill., has had recently two cases in new-born infants of acetanilid-poisoning, one terminating fatally, from the use of acetanilid as a dusting powder. In a case of erythematous inflammation of the skin of the nates, thighs, and groins, a powder composed of equal parts of subnitrate of bismuth and acetanilid was dusted upon the inflamed areas of a babe four days old, three or four times during the afternoon and night. On the following morning the babe was found deeply cyanosed, and died a few hours later. From a single application to a babe two days old deep cyanosis followed. Twenty-four hours later it had fully recovered from the toxic effects.

Some Unusual Forms of Scabies, with an Account of the Treatment of the Disease. (*Liverpool Medico-Chirurgical Journal*, January, 1896.) By Leslie Roberts, M.D., of Liverpool.

The symptoms of scabies fall into two groups: (1) those symptoms due to mechanical movements and life of the acari in the epidermis; and (2) those resulting from the reflex irritation of the spinal cord. After showing that the burrow may be preceded by other lesions due to reflex spinal excitement and scratching, the author cites a number of interesting cases, such as those of acarophoria, which occurs in persons who have recently recovered from an attack of scabies, and of acarophobia, when the patient suffers from a delusive form of cerebral pruritus, who has never been the subject of acariasis. It is stated that scabies may be derived from the horse, and when so contracted is capable of being cured more readily than when contracted from man, as the acarus of the horse is not in the habit of burrowing deeply.

Roberts then points out that success in the management of the disease depends very largely upon the clear recognition of the duality of its symptoms. The primary and mechanical lesions of acariasis can indicate but one line of treatment,—namely, the destruction of the acari and their ova. But our conduct towards the nervous group of symptoms must be guided by the conditions of the case. If the symptoms of inflammation are not too acute we may begin straightway with the means of destroying the acari. In his own practice, the writer follows the French custom of soaping the body of the person, and keeping him for half an hour in a warm bath. The part which acari are known to infest are well scrubbed (if there are no acute inflammatory symptoms) with a nail-brush, with the intention of breaking down the walls of the burrows. When this procedure has been satisfactorily carried out, the patient leaves the bath, is dried, and then well rubbed over with the antiseptic ointment. On the following morning

and evening the inunction is repeated, but not the bath; on the second morning and evening inunction is again repeated, and again on the morning of the third day. On the evening of the third day the patient takes to the bath for the second time, and the skin is cleansed from the ointment. If the first bath has been efficient, it will not be necessary to make use of the nail-brush. But now comes the crux where so many practitioners go wrong, by not clearly comprehending the duality of the disease. For the first three days our attention has been given exclusively to the killing of the acari, at the end of which time there should not be a living acarus on the body.

When the three days' slaughter has been accomplished, we have to face a problem of another sort,—namely, the treatment of the nervous and toxic symptoms. Now, our dealings with these symptoms must be conducted in a very different manner from that of the killing process. Our object now is to calm and heal the disorder. We are in reality no longer treating scabies, but eczema or a dermatitis. The exact line of treatment to follow will be indicated by the conditions of each individual case. Such, in outline, are the lines on which the treatment of every case of scabies should be conducted. Of course, there will be cases that will call for special judgment. Thus, in certain cases, the killing process will have to be suspended until the toxic or nervous symptoms have abated under soothing treatment. In Vienna a rather different process is followed to that just related, but the principle is the same in both. There they take advantage of the fact that the acari are entirely dependent upon the presence of moisture in the skin, and generally die if their water-supply is removed. Kaposi, therefore, follows the *dry method*. The patient is not bathed, but smeared over with a saponaceous ointment, containing naphthol and chalk, and then the whole surface of the limbs and body is sprinkled with starch-powder. This procedure is repeated twice daily for a fortnight, at the end of which period the patient takes a warm bath, and is cured.

For Insomnia due to Noise. (*Practitioner*, February, 1896.)—For those whose rest is disturbed by the noises of the street, by the howling of dogs, by the crowing of cocks, the cooing of doves, and the various sounds which murder sleep in town or country, the following plan may be commended: Professor O. Rosenbach, of Breslau, suggests plugs of cotton-wool steeped in vaseline, each six centimetres long, three centimetres wide, and one centimetre thick. The upper surface of the plug is smeared with vaseline, then rolled into the form of a cylinder and put into the auditory meatus to a depth of about two centimetres. The outer end is spread out in the concha, and outside this a layer of wool is applied. The plug is taken out in the morning, when the meatus must be well dried. Dry cotton-wool does not prevent the sonorous vibrations from reaching the tympanic membrane, but plugs greased in the manner just described do so effectually, though, of course, they do not prevent mechanical shaking.

The Present Position of Treatment with Organ Extracts. (*Therapeutische Wochenschrift*, iii., 4, 1896.) By Professor Fr. Kraus, of Gratz.

After discussing the history of this treatment, and then the functions of the thyroid gland, the author states that the symptoms of cachexia thyreoidea are those of a toxic influence governed by nervous disturbances, such as tetany, pareses, anæsthesias, and psychical disturbances. Death is caused by respiratory failure due to bulbar paralysis. Other changes are diminished blood-pressure, diminished number and resisting power of the erythrocytes, decreased amount of oxygen in the arterial blood, increased frequency of respiration, difficulty in swallowing, vomiting, glycosuria, impaired sexual power, menstrual disturbances, and imperfect development of the skeleton. Horsley recognizes three types,—neurotic, myxœdematous, and cachectic. All these morbid conditions can be cured by the introduction of thyroid substance into the body.

Given to healthy persons it causes loss of weight and diuresis. Occasionally large doses produce symptoms similar to those of Graves's disease. One doubtful case of death is reported.

The following conditions have been suggested as indicating the use of thyroid extract: 1, spontaneous and congenital myxœdema; 2, cachexia and tetania thyreopriva; 3, tetany; 4, struma parenchymatosa; 5, acromegalia; 6, exophthalmic goitre; 7, obesity; 8, certain skin-diseases (psoriasis, lupus, eczema); 9, new growths, such as syphilis, leprosy, tuberculosis, carcinoma; 10, mental diseases and epilepsy.

For myxœdema, as the study of about one hundred and fifty cases shows, thyroid extract is almost a specific; where mental disturbances coexist, if dependent upon the myxœdema, they are also benefited. In tetany, however, in spite of its close relation to myxœdema, the results have been negative. Exophthalmic goitre would not seem to be adapted to this treatment, if the theory of Möbius that it is due to excessive action of the gland be true, nevertheless, the clinical results are not wholly unfavorable. Of twenty cases, ten were not affected, several made worse, and a few cured. Kraus himself has given the extract to three cases, of which one, a mild, recent case, was cured, one made worse, and one unaffected. In acromegalia certain doubtful results have been obtained. More successful have been the experiments in goitre. In young individuals the parenchymatous form seems to react promptly and well. Bruns, Ewald, and Miculicz have reported a number of successful or partially successful cases.

Kraus strongly disapproves of the use of thyroid extract in mental disorders and epilepsy, although some good results have been reported, and is equally emphatic concerning skin-diseases. He bases his opinion upon the extreme doubtfulness of the results and the absence of a scientific basis for the treatment. Menzier has reported very excellent results in malignant syphilis. Kraus has made a number of experiments upon tuberculous patients, but entirely without result.

In corpulency, particularly that of old people with some anæmia, the

results have been excellent. No change is made in the diet, and the treatment is, therefore, always acceptable. Certain symptoms of thyroidismus, as tachycardia, are to be avoided.

The medicatio pancreatica has apparently a good physiological basis, as animals in which pieces of pancreas have been implanted resist exceedingly well pancreatectomy. Nevertheless, no good results have been reported in cases of glycosuria, nor has the author himself been at all successful. The effect of suprarenal feeding upon Addison's disease has been only to increase the diuresis. The following conditions are given as indicating the injection of testicular fluid: Senility, debility, and such nervous diseases as tabes dorsalis, neurasthenia, epilepsy, chorea, paralysis agitans, and mental disorders. The author has obtained excellent results in cerebral neurasthenia. [Dr. Osler reported in the February number of this magazine a case that was treated with marked benefit with extract of the suprarenal bodies.—J. S.]

SURGERY.

IN CHARGE OF HENRY R. WHARTON, M.D.,

Demonstrator of Surgery and Lecturer on Surgical Diseases of Children in the University of Pennsylvania; Surgeon to the Presbyterian Hospital, the Methodist Episcopal Hospital, and the Children's Hospital; Consulting Surgeon to the Presbyterian Orphanage,

JOSEPH P. TUNIS, A.B., M.D., Assistant Demonstrator of Surgery in the University of Pennsylvania, AND J. P. ARNOLD, M.D., Medical Superintendent of the Presbyterian Hospital.

Tuberculosis of the Hip-Joint. (*International Clinics*, January, 1896.) By John Ashhurst, Jr., M.D.

The large majority of cases of hip-disease have as their essential lesion the existence of tuberculosis in some of the tissues about the joint, and superadded, in many cases, to the previous existence of the tubercle bacilli in some part of the body is a slight traumatism which seems to determine the locality in which the disease shall be developed. Modern pathologists believe that the tubercle bacilli may be stored up in some part of the body, probably in the bronchial glands, and a place of less resistance being developed in some of the tissues as a result of slight rather than of severe bruises, the tubercle establishes itself at that point and goes on to the production of hip-disease.

The lesions of tuberculous hip-disease may begin in any one of the constituent parts of the joint. Tuberculosis may exist first in the head of the bone, or in the neck, the consequent destruction of which sometimes leads to separation of the head, which remains as a sequestrum in the articular cavity; or, again, in rare cases the disease begins in the acetabulum; it may also make its first appearance in the soft tissues, and especially in the ligamentum teres. The function of the ligamentum teres as explaining

the circumstances under which it may become involved in hip-disease, and explanations for the very marked changes observed in the head and neck of the femur are points of especial interest.

Bone changes may be most prominent in the neck, it being partially or quite absorbed, or in the head which may be reduced to a mere osseous button. The changes in the head of the bone are due to a combination of three causes: (1) the presence of tubercle; (2) the attrition of the head of the bone against the acetabulum; and (3) the maceration of the bone in the purulent contents of the joint. As regards the changes in the neck of the bone, we have a very interesting alteration in the shape of the neck and in the angle which it makes with the femur. The head of the bone in the normal position occupies a position considerably above the level of the trochanter, and the neck joins the shaft at an angle of about one hundred and forty degrees, varying somewhat at different periods of life, but always making an obtuse angle with the shaft. In some cases of hip-disease the neck is shortened and the angle of its attachment reduced to about one hundred and thirty degrees; or the head is separated from the neck, which occupies a position at right angles to the shaft; or the head and neck may both almost entirely disappear, the neck being at right angles to the shaft. This striking change in the neck of the bone is due to a rarefying osteitis, which is not necessarily a tuberculous lesion. It is spoken of as a senile change because it is found in old persons; but Sir George Humphrey, of Cambridge, England, has demonstrated by comparative observations in persons who had been subjected in early life to amputation of one of the lower limbs, that this change is not dependent upon old age, but is a result of pressure. A rarefying osteitis by softening the bone may produce the so-called senile change in a few months, and the angle of the neck of the bone may be so changed that the trochanter slips as it were beyond the head, which still remains in its socket.

Most surgeons are under the impression that the ligamentum teres has no function, but it really has an important one. It may be described as a suspensory ligament of the trunk. When the patient is erect it is almost a vertical ligament. The weight of the body is sustained mostly by the head of the femur in more or less contact with the cotyloid cavity; but these ligaments serve to diminish the pressure of the pelvis upon the head of the bone, and to lessen strain. They also prevent sudden concussion, which would otherwise be experienced at every step we take. As a result of stress put on the ligament in the various movements of the part it becomes weakened, and thus a place of less resistance is made in which a deposit of tubercle follows; the ligament, softened and partially disintegrated, ceases to protect the joint, the other constituents of which then suffer from the effects of concussion and other slight traumatisms, and in turn become tuberculous. The primary lesion of the ligamentum teres thus furnishes a prolific cause of hip-disease.

The following typical case of coxalgia shows apparent cure after nine

A case of cured coxalgia, with the diseased limb in a position of flexion, nine months after treatment was begun.

months: Edna K., aged nine years, complained of pain in her left knee in February, 1895. In April she began to be lame and the slightest motion of the left hip caused pain. A diagnosis of incipient coxalgia was made. The patient was admitted to the Methodist Episcopal Hospital, and there remained in bed for four months with sand-bags on either side of the left leg and an extension of four pounds in weight. A plaster-of-Paris dressing was then applied, and she was allowed to get about with a high shoe on the sound leg and crutches. There was now slight pain on free motion, especially when the knee was flexed on the abdomen. In November, eight months after treatment was begun, there was very slight fixation on extreme flexion, and no pain whatever. This is well shown in the plate, in which the child may be seen standing on her right foot, with the left one elevated in such a way as to bring the knee on the affected side almost up to the abdominal wall.

It is probable that in this case the disease was arrested promptly by the treatment instituted, and if so, it is probable that the disease was limited to the articular cartilage of the head of the bone, and the inflammatory process arrested before the development of any rarefying osteitis.

Treatment of the Sac in Hernia. (*Annals of Surgery*, January, 1896.) By Gwilym G. Davis, M.D.

The author describes a new method of treating the sac, suitable for both inguinal and femoral hernias. The sac having been opened, its contents

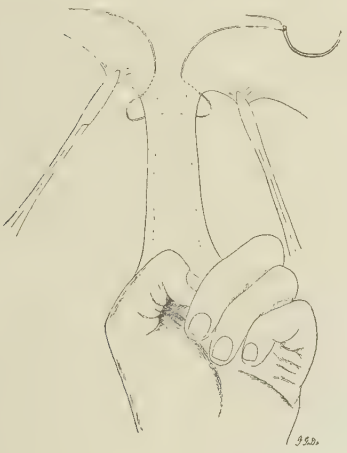

FIGURE I.

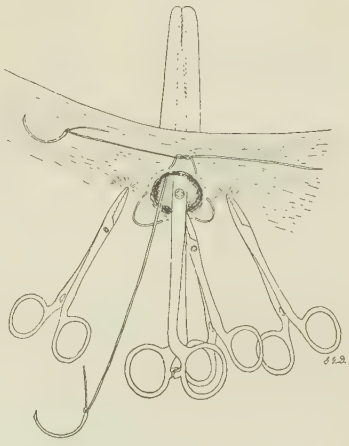

FIGURE II.

FIGURE III.

are returned to the abdomen. The left index finger is then introduced until its tip reaches the neck of the sac, the remainder being grasped by the thumb and other fingers (Fig. 1). Three hæmostatic forceps are attached to

the abdominal continuation of the sac, a short distance away from the finger, one is on each side and one behind. A curved needle threaded with silk-worm-gut, or other substance, is passed in and out three times, encircling the neck of the sac, carefully avoiding the larger vessels. Only half the circumference is included, because as each stitch emerges it skips as much as was included in the previous one. (See Fig. 1.) The finger is now withdrawn and the intestines prevented from descending by pressure made by an assistant. Four inches only of the sac is retained, the remainder being cut off. The retention of a greater amount causes liability to sloughing. The distal end of the sac is then transfixed with a catgut thread, which is left hanging. The end of the sac being grasped by a long forceps, it is inverted (Fig. 2), like the finger of a glove, its full length into the abdominal cavity.

An assistant now ties the ligature and the three hæmostatic forceps are removed. The catgut hanging out is now seized and pulled taut, thus folding the sac on itself, as in Fig. 3: it is fastened by stitching through the adjoining tissues. The ends of the purse-string ligature around the neck of the sac are then threaded on needles and brought up through and tied on the upper surface of the muscles. The gap in the walls is closed by Bassini's, Halsted's, or other plan. This method fixes a pad on the inner side of the peritoneum. Its agglutination is favored by scraping the interior of the sac with a curette before inverting. The method is also applicable to femoral hernia, and it is suggested that a chip be chiselled from the pubic bone to help block the femoral canal.

Movable Kidney. (*Annales des Maladies des Organes Génito-Urinaires*, July, 1895.) By M. Albarsan, M.D.

After discussing at length the symptomatology and pathology of this condition, the author discusses carefully the different modes of treatment and the particular cases to which they are adaptable, summarizing his views in regard to operation as follows:

1. Operate upon all movable kidneys in which there are present other pathological conditions.

2. In acute symptoms or crises, either painful or mechanical, attempt relief by means of bandages. If these means are successful, give the patient the choice between wearing an orthopædic bandage continuously and an operation. If the bandage does not give relief operate.

3. In case of hysterical or neurasthenic complications, use the bandage first, and do not operate until this has proved ineffectual.

4. In cases of enteroptosis, use simply the bandage and do not operate unless the kidney of itself produces symptoms that are serious and beyond the help of orthopædic surgery. And when operation is required an orthopædic bandage should also be employed.

5. When there are no acute symptoms a bandage should be worn nevertheless.

Catheterization of the Ureters in the Male. (*Journal of Cutaneous and Genito-Urinary Diseases*, December, 1895.) By A. Bradley Gaither, M.D.

The methods here given are those introduced and practised by the late Dr. James Brown.

The Nitze-Leiter cystoscope, with Brenner's modification, is used. The operating-table should be ninety-two centimetres high, with an extension on the top forty-five centimetres wide, projecting forty centimetres. The patient lies on his back, with his buttocks on the end of the projecting board, the legs widely separated and resting on stools sixty-four centimetres high.

The urethra is irrigated with a 1 : 40,000 bichloride-of-mercury solution, and two cubic centimetres of a four-per-cent. solution of cocaine are injected into the deep urethra, and four cubic centimetres into the anterior. It is sometimes necessary to use ether or chloroform.

The bladder is washed, through a metal catheter, with Thompson's fluid, which is run in by siphon, care being taken not to distend the bladder. When the solution returns clear, the bladder is emptied, and from one hundred to three hundred cubic centimetres are introduced.

The electrical power for the light is obtained from a four-cell storage battery made by the Southern Electric Company. The connections should be made and the light tried with the cystoscope in the jar, just before introducing into the bladder. The cystoscope, having been sterilized in a five-per-cent. carbolic-acid solution for one hour, and then lubricated with glycerin, is introduced, and absorbent cotton wrapped around the ocular end to take up the few drops that will escape between the time the stylet is removed and the catheter inserted. The ureter of the suspected kidney is first sought, and if it is not easily found it may be located by occasional jets of urine shooting across the window. The presentation can be changed by raising or lowering the patient's leg, or it may be necessary to increase or diminish the amount of fluid in the bladder. When ready to catheterize, the stylet is withdrawn and the catheter quickly slipped into the canula.

As the catheter is pushed into the ureter, it can be distinctly seen running under the mucous membrane of the bladder. It is introduced eight centimetres, and, while in the ureter, is kept under constant observation. The first drops appear in from one to five minutes, and are allowed to escape. A sterilized test-tube receives the urine, and in from five to ten minutes enough can be collected for the purpose of analysis. The Nitze-Leiter cystoscope can be used continuously if the current is turned off for one minute at the end of each ten minutes.

It is essential in all cases, in order to catheterize the ureters, first, that the bladder shall be capable of holding sufficient fluid to bring the mouths of the ureters into view; second, that cystitis or hæmaturia do not exist to such a degree as to render cloudy the fluid introduced into the bladder before a reasonable time has elapsed.

The Technique of Maunsell's Method of Intestinal Anastomosis. (*New York Medical Journal*, December 14, 1895.) By Frederick Holme Wiggin, M.D.

The writer, at the request of Mrs. Maunsell, has revised an article written by Dr. Maunsell which gives the technique of his method of intestinal suture.

After the preparation and anæsthetization of the patient, a median incision is made in the abdominal wall below the navel, or if the site of the disease or injury can be localized, the incision is made over that site. The portion of intestine to be excised is then located and brought outside of the cavity, together with about six inches of healthy intestine on either side. It is next emptied of its contents above and below the diseased part by passing it between the finger and thumb and gently compressing it. The empty gut is then clamped on either side of the diseased portion at points six inches distant.

The general peritoneal cavity is shut off by flat sponges rendered sterile and wrung out of a hot saline solution, and the exposed portion of the bowel should be protected by the same means. The portion of intestine to be removed is excised by means of a V-shaped incision, which has its apex in the mesentery and its lateral borders on either side of the diseased point. The mesenteric vessels are ligated before being cut by passing a needle armed with catgut around them, and tying it, or they can be ligated as they are divided.

The divided ends of the intestine are washed with a hot saline solution, followed by a small quantity of a fifteen-volume solution of hydrogen dioxide, and the proximal and distal ends are united primarily by means of two temporary sutures, the first placed at the mesenteric border, and the second directly opposite at the highest point of the superior border. These are tied and left with long ends.

A longitudinal incision, an inch and a half long, is next made in the superior border of the larger intestinal segment, two inches from its severed end, by pinching up the intestinal coats between the finger and thumb, and dividing them with a narrow-bladed knife.

The long ends of the temporary sutures are caught up and drawn through the opening until the ends of the segments of the bowel are invaginated and made to appear through the incision as concentric rings. The ends of the long sutures are then held by an assistant while the sutures, twenty in number, are placed and tied. A fine, straight needle armed with a strand of horse-hair is used, and is passed through all the coats of the bowel and through both sides about a quarter of an inch from the divided ends. The suture is caught up by forceps, divided in the middle, and tied at once on either side. The temporary sutures are then cut off, the cut ends of the bowel are dusted over with either iodoform or acetanilide, and the invaginated portion is reduced by means of gentle manipulation accompanied by slight traction. The edges of the longitudinal opening are turned in, and it is

closed by Lembert sutures passed through the peritoneal, muscular, and submucous coats.

An anastomosis of segments of ileum and colon may be effected by passing three temporary sutures, one at the mesenteric border, a second through the side of the larger segment at the point where the superior border of the smaller segment touches it, and a third is passed through the highest free end of the larger segment. The ends of the sutures are drawn through as before, traction is made, and the free edge of the larger segment is inverted and invaginated, being accompanied by the smaller segment which is only invaginated. If the difference of calibre between the two segments is great, a V-shaped portion of the convexity of the larger segment may be removed. Gastro-enterostomy is performed as follows: A portion of the jejunum is drawn out, emptied of its contents, and clamped. A portion of the greater curvature of the stomach is also drawn into the incision and the jejunum is fastened to it by several Lembert sutures in such a way as to lessen strain on the permanent sutures. An incision is then made in the superior border of the gut and a corresponding opening in the stomach an inch above the greater curvature and parallel to it. The extreme ends of these wounds are united by sutures which are tied and left with long ends. An opening is then made near the centre of the stomach, the wounds in the bowel and stomach are invaginated through it and sutured, as already described. The invagination is then replaced and the slit in the stomach closed by Lembert sutures.

The author has found, in his various experimental intestinal anastomoses performed in accordance with this method on dogs, the following points in the technique to be of consequence:

1. The longitudinal slit which is made in the segment of bowel having the greatest calibre (proximal or distal), and through which the invagination occurs, should be located at least two inches from the cut end of the bowel.

2. The mesentery of both segments must be included in the first temporary suture which is passed at this intestinal border; this prevents sloughing of the bowel at this point.

3. The sutures should be placed at least a quarter of an inch from the cut intestinal edge; they should be interrupted, about twenty in number, and should not be drawn too tightly when they are tied.

4. The best suture material for this work is carefully tested and prepared horse-hair.

5. The needle best adapted to this work is a round, straight one (milliner's, Nos. 6 to 9).

6. The invagination after the sutures have been placed must be carefully reduced, rather by manipulation than by traction, otherwise the sutures may cut out.

7. In closing the longitudinal slit too much of the intestinal edges should not be turned in, or a contraction may result at this point.

A Case of Gastrotomy for the Removal of Hair-Ball; Recovery. (*Journal of the American Medical Association*, February 1, 1896.) By W. L. Allen, M.D., Davenport, Iowa.

A hair-ball was removed from a female, aged sixteen, and had the following dimensions: diameter, cardiac to pyloric extremity, nine and a half inches; entire length, including duodenal part, seventeen inches; circumference at pyloric extremity, eight and a half inches; circumference at greater curvature, eight and a half inches; circumference at cardiac extremity, five and a half inches. The girl had been in the habit of eating her hair since she was three years old, and up to two years ago. The large size of the foreign body did not interfere with a fair degree of health.

NEUROLOGY.

IN CHARGE OF LANDON CARTER GRAY, M.D., New York City,
GUY HINSDALE, M.D., Philadelphia,
WILLIAM BROADDUS PRITCHARD, M.D., New York City, AND WM. G. SPILLER, M.D., Philadelphia.

Diphtheritic Paralysis.—Felsenthal, in a recent critical digest of the literature of paralytic phenomena following diphtheria, reaches conclusions, some of which are as follows: Paralysis of the heart, most important, may occur at any period of the disease, and as late as the sixth week of convalescence, the cause, in the latter instance, being a myocarditis. The advice of Henoch, "Never give a favorable prognosis in diphtheria until six weeks shall have elapsed after all local signs have disappeared," is wise therefore. Symptoms indicative of impending cardiac paralysis are apathy, pallor, anorexia, insomnia, emesis, and præcordial pain. (Another writer notes epigastric pain of acute and obscure origin as also having a very constant premonitory significance.) The heart-tones become distant, the second sound showing the gallop rhythm. The respirations are accelerated, merging towards the termination into the Cheyne-Stokes type. Recovery, which is rare, is always tedious, and convalescence covers a period of many weeks or even months. The sole indication in treatment is to sustain the heart pending the disappearance of the diphtheritic intoxication.

The author does not sufficiently emphasize the value of strychnine in proper dosage hypodermically (from $\frac{1}{60}$ grain to $\frac{1}{6}$ grain) in these cases. It is the most reliable therapeutic recourse available, and its use should constitute, at least internally, a part of the routine treatment of all cases of diphtheria from the inception of the disease. With the paralysis of the velum, manifested by nasal voice, regurgitation of food, etc., there may be paralysis of the œsophagus, epiglottis, and larynx, with anæsthesia, which latter condition

involves the danger of choking from food entering the larynx and bronchi, a danger readily obviated by the use of a soft rubber tube, which should always be used in such cases in feeding. The pathological process responsible for the paralysis is that of an infectious neuritis beginning in the nerve-endings contiguous to the primary focus of infection. Changes in the spinal cord, chiefly ganglion-cells, often coexist. The milder cases are self-limited; the more grave, however, demand prompt and active treatment. A case of interest in connection with this subject described as one of paralysis consecutive to a pseudo-membranous angina, recognized as non-diphtheritic by the bacteriological examination (a spray of bichloride had been employed, however), has been reported by Bourges (*Archiv experimentelle de Pathologie*, 1895). Only the streptococcus pyogenes was found, the Klebs-Löffler bacillus being absent in two examinations.—*Der Kinderartz*, 1895.

Prognosis in Cerebral Hemorrhage.—Barr, in a lecture upon this subject, delivered at the Leeds General Infirmary, presents the following conclusions: In any case of apoplexy due to hemorrhage into the hemisphere, if renal disease, Cheyne-Stokes respiration, or hyperpyrexia, either or all of them, or two of them, are present, the patient will almost certainly die. If no one of these is present and does not supervene, he will probably recover, regardless of the degree or duration of insensibility. Diabetes, chronic alcoholism, typhoid fever, or extreme anæmia (idiopathic) exert an effect just as fatal as associated disease of the kidney in hemorrhagic apoplexy.—*British Medical Journal*, May 18, 1895.

Belladonna with Potassium Iodide as a Means of Preventing Catarrhal "Iodism."—Cohen, acting upon the theory that the catarrh of iodism is due either to iodine being secreted by the salivary glands, or to the circumstance that iodide of potassium is broken up in the mouth after its secretion, and free iodine is liberated, producing the catarrh just as the inhalation of iodine vapor will, gave five minims of belladonna with each dose of potassium, with the primary object of lessening the salivary secretion, the result being satisfactory in each case (*Lancet*, July, 1895).

Valentine has recently revived the suggestion of Erhlich and Koenig, that sulphonilic acid would accomplish the same purpose, exhibiting an almost specific effect, not only upon the catarrh of iodism, but also upon ordinary and more common forms. He suggests the following formulæ:

℞ Acid. sulphonilic., ʒiiss;
Sodii bicarb., ʒii;
Aquæ destil., ʒx.—M.
Sig.—Dessertspoonful in water *bis die.*

or,

℞ Sodii sulphonilat., ʒiiss;
Aquæ destil., ʒviss.—M.
Sig.—Three drachms *bis die.*

Two Cases of Brain Tumor in Two Sisters (Hæmangiosarcoma or so-called Perithelioma) located near the Third Ventricle. (*Deutsche Zeitschrift für Nervenheilkunde*, vol. viii., Nos. 1 and 2.) By Gustav Besold, M.D. Clinic of Professor Strümpell.

The parents of these two sisters are still living and are in good health. The patients, one of sixteen and one of eleven, showed symptoms which made the diagnosis of brain tumor very probable,—viz., rapidly increasing weakness, headache, vomiting, disturbance of sight followed by blindness, due to choked disk, and later to atrophy of the optic nerves; and symptoms of motor irritation,—attacks of tonic contractions, and later in the disease permanent contractures. In both sisters the right side of the body was more involved. Intelligence, speech, hearing were affected, and in one patient the sense of smell was lost. The tumors were not localized, although they were supposed to occupy a median position.

The autopsies showed that the tumor had probably originated in each case from the left optic thalamus, and had soon extended to the right hemisphere; that this had caused internal hydrocephalus by involvement of the veins of Galen, and that to this many of the symptoms were due.

The early appearance of choked disks followed by optic atrophy, the rapid failure of the intellect, the nearly equal paresis of the extremities with increased muscular tonus, the frequent tonic muscular contractions could have led to the diagnosis of a location near the third ventricle with secondary hydrocephalus.

The tumor in each case was a hæmangiosarcoma, or endothelioma, or perithelioma.

The interest of these cases lies in the development of a tumor, almost identical in nature, in two sisters of youthful age, in the same portion of the brain. They are important for the theory of tumor formation in general. Thiersch and Cohnheim have expressed the opinion that many tumors are due to congenital conditions, and it is this theory which Dr. Besold accepts for his cases. In the elder sister other congenital anomalies were present,—an open foramen ovale and a double ureter.

A similar condition of brain tumor in two members of the same family is not known. Strümpell has reported the presence of sarcomata in the kidneys of two brothers.

In one of Dr. Besold's two cases slight degeneration was found in the posterior columns of the cervical cord, especially near the posterior roots, and was believed by him to be due to a general marasmic condition of the patient. In the same cord the tract of Gowers on both sides was degenerated in the upper cervical region.

Local Alopecia in a Case of Traumatic Hystero-Neurasthenia. (*Revue Neurologique*, January 15, 1896.) By P. Ladame, M.D., of Geneva.

A man, of fifty years, fell from a scaffolding, and apparently was not seriously injured, although he was unconscious of the events which had

occurred. There was no trace of nervous or mental disease in his family. After the accident he was very excitable, spoke incessantly, sang, whistled, and struck the persons near him. For three weeks he had incontinence of urine and fæces, and was forced to take morphine in order to sleep. Gradually he became quieter, but suffered from headache and vertigo, and was incapable of all work. His character was greatly changed, his intellectual faculties, more especially his memory, were greatly impaired. The entire frontal region of his head was hyperæsthetic, and more so near a cicatrix over the left parietal bone. At this part his hair had fallen out so that now very little remains; previous to the accident the growth here had been abundant. The fields of vision, especially that of the right eye, were concentrically contracted. The field for red was very contracted, whereas that for green was larger. Hearing was much impaired, but there was a cicatrix in the left tympanic membrane. Muscular force was much diminished in the hands. Sensation was present everywhere for all qualities, but was diminished over the entire right side.

The diagnosis of traumatic hystero-neurasthenia was made, and the loss of hair was attributed to trophic trouble.

Oppenheim has also described alopecia in traumatic neurosis.

Asthenic Bulbar Paralysis. (*Deutsche Zeitschrift für Nervenheilkunde*, vol. viii., Nos. 1 and 2.) By Professor A. Strümpell.

The name of asthenic bulbar paralysis has been given by Strümpell to this peculiar disease. The case which he describes makes twenty-one now on record. The ordinary symptoms as presented by him are the following:

The disease appears usually before thirty, even as early as the age of twelve or fifteen, with, perhaps, a slight preference for the female sex. It commences gradually and without apparent cause, but the evolution may be quite rapid, and result in a most serious condition. Occasionally there is at first pain, never very violent, and mild vertigo. An early and most important symptom is the *rapid fatigue*, usually shown in those muscles whose nerve-centres are in the medulla, pons, and crura. The first symptom may be heaviness of the eyelids and diplopia, or else difficulty in mastication, speaking, or swallowing. Involvement of the trunk and limbs usually occurs later, although the disease may commence in these parts. Muscular twitchings, even in the tongue, usually fail. When the disease is fully developed there is permanent paresis in the levatores palpebrarum, in all the muscles innervated by the seventh nerve, and in the muscles of mastication, elsewhere there is great and rapid fatigue after slight effort, which amounts almost to complete paralysis. This is noticed especially in swallowing, chewing, and speaking, although it is also true of the movements of the limbs. The permanent paresis is found in those muscles which are continually in tonic contraction and have little rest,—*i.e.*, in the levatores palpebrarum, the muscles of expression, and the masseters,—the latter by contraction prevent falling of the lower jaw. In some cases a permanent

paralysis of the muscles of the eyeballs is present, but these are also in constant tonicity, often these muscles are entirely spared. Of the muscles below the head only those of the back of the neck have been found permanently paretic, the same explanation answers here.

Ptosis is often the first symptom, and when the muscles of the eyeballs are spared it is important as showing an involvement of one branch of the third nerve. Reaction of the pupils to light and accommodation always seems to be normal. The extremities are almost invariably involved, but weakness of the muscles of respiration, if it occurs at all, appears late, and the heart or the sphincters have never been found affected. On certain days the patient has much more power than at other times; on the other hand, menstruation impairs the condition.

Sudden relapses are common, and may occur even one or two years after apparent recovery.

No microscopical changes have ever been found in any of the tissues, and from the clinical condition gross lesions could not be expected. Strümpell is disposed to accept the theory of intoxication, though he cannot say if the poison is elaborated in the body or taken from without. It is exclusively an affection of the motor system. The same exhaustion is shown in contractions to the faradic current, which proves that the peripheral neuron is involved, perhaps alone, although the disease may be muscular. The knee-jerk is prompt, and muscular atrophy does not occur even after a long period. The prognosis naturally is always doubtful.

A Contribution to Brain Surgery with Special Reference to Brain Tumors. (*Medical Record*, February 1, 1896.) By M. Allen Starr, M.D., Ph.D.

According to Dr. Starr experience has shown that operations for cortical epilepsy are very disappointing, and that the attacks are almost certain in the end to recur. The cicatrix made by the surgeon is not very different in its effects from that made by a trauma.

Only seven per cent. of brain tumors are open to operation. Removal of a portion of the skull for the relief of intracranial pressure is justifiable where the tumor cannot be located, such a procedure may prolong life and may cause marked change in the circulatory conditions, which aids in the absorptive power of certain drugs. Mercury and iodide of potassium have cured tumors which were not syphilitic. Dr. Starr reports a case of cerebellar tumor in which the diagnosis was based on the most characteristic clinical history, where syphilis was not present, which was to all appearances cured by the use of the above drugs. He confirms Macewen's statement that on the side of the tumor or abscess there is sometimes a clearer, higher-pitched, and more resonant note than upon the opposite side in auscultatory percussion of the skull. He considers it justifiable to operate for removal of the growth where the symptoms seem to indicate that access is easy and that the tumor is superficially located, but the most

reliable symptoms sometimes lead to errors of diagnosis. One of his cases where focal epilepsy had been present revealed at the autopsy a sarcoma deep within the centrum ovale. According to his opinion it is impossible to distinguish accurately between cortical and subcortical tumors. New formations at some distance from the motor region may cause motor symptoms indirectly by irritation or pressure, and ataxia of a cerebellar type may be due to lesions of the frontal lobes. This form of ataxia is usually associated with hemiparesis or monoparesis, localized tenderness to percussion or pressure over the frontal region, optic neuritis occurring late and early development of mental dulness (Bruns). Cerebellar tumor may cause pain in the opposite frontal region. Large incisions for the removal of tumors may be made into the brain without danger to life, but cysts offer a more unfavorable prognosis, as they are apt to form again. In gummatous tumors when antisyphilitic treatment has failed operation is proper. He prefers the flap operation to the operation of trephining.

The statistics which Dr. Starr has collected up to the present time give the following results: Out of one hundred and sixty-two cases operated upon for brain tumor, no tumor was found in forty-eight, in seven the tumor was not removed, seventy-two cases of removal resulted in recovery, thirty-five terminated in death.

Multiple Neuritis the Essential Element in Landry's Paralysis. (*Boston Medical and Surgical Journal*, December 26, 1895.)

Dr. George L. Walton holds that Landry's paralysis is an acute toxic disease, characterized by rapid loss of power in the lower extremities, trunk, and to a less degree in the upper extremities, affecting also the vagus and phrenic, sometimes other cranial nerves. The affected muscles are lax. Pain, paræsthesia, anæsthesia, and tenderness are generally present in varying degrees, though in some cases sensory disturbances are wanting. Death follows in more than half (sixty-four per cent.) of the cases. Recovery, when present, is very slow. The reflexes, deep and superficial, are lost at an early stage; wasting and reaction of degeneration appear if the patient survives. The process is a toxic affection of the peripheral nerves (neuritis), cord, and brain, the former being the essential and persistent lesion.

In the case which Dr. Walton minutely describes, the infection arose from pyelitis due to stone in the kidney. After removal of the calculus and thorough drainage, complete paralysis of the lower extremities persisted with marked wasting and coolness.

Horse-Nettle (Solanum Carolinense) in the Treatment of Epilepsy. (*Journal of the American Medical Association*, December 14, 1895.) By C. F. Barber, M.D.

Dr. Barber used the remedy on insane epileptics, and his experience was that the immediate results were encouraging, for no convulsions occurred

for days. For several weeks the improvement continued, some of the patients brightening mentally. He concludes:

1. That *solanum carolinense* is not a substitute for the treatment now generally accepted for epilepsy.

2. That it is a preferable substitute for the bromide treatment when compared with the use of biborate of sodium.

3. That it unquestionably has an influence over the disease, although mild. It sufficiently controls the disease to warrant us in substituting it for a time to relieve our patients of the depression produced by the bromide treatment.

4. That its toxic effects are *nil.*

OPHTHALMOLOGY.

IN CHARGE OF CHARLES A. OLIVER, A.M., M.D.,
Philadelphia, Pennsylvania,
AND
EDMUND LANDOLT, M.D.,
Paris, France.

Enchondroma of the Cartilage of the Upper Lid. (*Journal of the American Medical Association*, November 9, 1895.)

Peter D. Keyser, of Philadelphia, has had the rare good fortune to make a careful clinical and microscopical study of this almost unique form of neoplasm.

Eight years previous to the report the subject, a fifty-eight-year-old woman, presented herself at his clinic at the Wills Eye Hospital with a round lump in the upper lid which she said had been slowly growing without any sign of inflammation for a year or two. The tumor was hard and solid, and was firmly attached to the cartilage. An incision was made along the lid over the tumor and the convexity was shaved off. This was found to be firm, cartilaginous, cutting crisply, and presented a yellowish-white appearance, like thickened cartilage. No microscopic examination of the part removed was made.

In 1890 the patient reported with a much larger return of the growth. It was again operated upon as in the former method. No examination was made. In 1892 the tumor had grown again, and appeared more nodular. At this time the author's purpose was to try to remove all of the diseased cartilage, leaving, if possible, the conjunctiva, so as to protect the cornea. To do this, the edge of the lid was carefully slit up, and as much as possible of the cartilage was removed. This seemed to do well for awhile, but after six or eight months the growth again began to rapidly develop, growing along the whole cartilage and taking upon itself a well-developed nodular form with a small open sore upon the edge of the lid.

Operative interference to remove the unsightly looking lid and to relieve distress was again deemed necessary. The edge of the lid was slit and the skin was dissected sufficiently to expose the whole growth. The cartilage of the nodule on the nasal side with the conjunctiva was removed, while that of the temporal side was dissected out as much as possible, leaving the conjunctiva.

The removed portion was prepared for microscopic study. Careful examination showed that the growth was of an enchondromatous formation, and, as it was a simple outgrowth from the normal cartilage, it was decided that it might come under Virchow's term of enchondroses. There were well-developed walls with the cartilaginous cells lying therein, some of which were separated, while others were packed closely together. There was also glandular tissue.

An Alveolar Fibro-Sarcoma of the Optic Nerve. (*Archives of Ophthalmology*, April, 1895.)—Finlay, of Havana, Cuba, has had the good fortune to study the histological appearances of an alveolar fibro-sarcoma of the optic nerve, which occurred in the practice of Lopez, of the same city. As he says, it was curious to note the difference in the structure presented by the tumor at different points. He found that it was instructive to follow the transition from the more highly organized alveolar sarcomatous condition to the more atypical ordinary variety and into the still more lowly organized myxosarcoma.

In a careful analysis of the statistics of the results of operative procedure in such cases, he believes that "an operative interference is called for as soon as the diagnosis is made, as the tumor, if left to itself, will almost necessarily produce death, and the earlier the operation is performed the greater the chance of success." He thinks that the comparatively large proportion of deaths immediately after the operation makes a strict adherence to the rules of aseptic and antiseptic surgery a necessity, and that the presence of metastatic growths within the cranium or of a direct intracranial extension seems to predispose to infection of the meninges; if such an extension can be inferred, all operative interference, with a radical cure in view, is contraindicated.

He says that, in view of the good statistical returns, an attempt at preserving the eyeball is justifiable and even recommendable, provided an ophthalmoscopic examination permits one to infer that there is no extension of the growth into the interior of the eye, and that the presence of the eyeball does not interfere with the complete excision of the tumor by limiting the field of operation.

He believes that where there is any suspicion of an extension into the orbit, an exenteration should be performed, and says that the results of operation on recurring growths are not encouraging, but thinks that an exenteration of the orbit may be at times beneficial, provided that there are no grounds to suspect an intracranial extension.

Report of a Case of Scopolamine Intoxication produced by the Instillation of Four Drops of a Four-Grain Solution of the Drug into Each Eye. By Edw. E. Hazlett, M.D., Health Officer of Dickinson County, Abilene, Kansas. (Personal Communication to Dr. Oliver.)

"E. P., female, aged six years, of nervous temperament, but in perfect health, was brought to me for adjustment of refraction. Preliminary examination: V. both eyes = $\frac{6}{12}$. Instillation of two drops of a four-grain solution of scopolamine hydrochlorate in each eye and repeated in ten minutes was immediately followed by a dazed and stupid condition. Her gait became staggering and she dragged her feet as if very tired. Speech became difficult, and when spoken to she failed to answer intelligently. Examination was discontinued and the child, unable to walk, was carried home. Several hours later I was called to find her actually maniacal. Reclining on a lounge, when placed in sitting posture she would reel as if drunken. Mentally, she was greatly agitated with profound delusions and hallucinations, seeing not only wild beasts and a man that was trying to kill her, but the letters of Snellen's test-types everywhere, on the walls of the room and on adjacent buildings. She would cry out in an excited manner, pointing with her finger, 'See that big N over there,' and would then rapidly name many of the larger letters of the test-types. She would constantly reach for some imaginary object and go through the motions of eating it or of otherwise disposing of it. This condition lasted about ten hours, when, under the use of sodium bromide, she quietly fell asleep, to awake some six hours later in a normal condition."

The letter further states,—

"Three years since I had a case of acute mania lasting three or four days from the use of a four-grain to an ounce solution of atropine occurring in the eleven-year-old daughter of a neighboring physician. Recently I examined this child after the use of scopolamine from the same solution as that used in the case I now report, with no untoward effects."

PATHOLOGY.

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AND
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Researches on the Anatomical Alterations of the Optic Nerve in Intoxication by Ethereal Extract of Male Fern. (*Bulletin de l'Académie royale de Médecine de Belgique*, Series iv., vol. ix., No. 10, 1895.) By M. M. Masius and A. Mahaim, of Liége.

In intoxication by the ethereal extract of male fern, the anatomical alterations of the optic nerve vary, not alone with the intensity and rapidity

of the poison, but also with the portion of the nerve examined, whether it is situated in front of, within, or behind the optic foramen. In a dog that had been given two- to three-gramme doses of this drug every other day for two months, and that had been blind for two months and a half, the following conditions were noted: Near the retina the interfascicular connective tissue is thicker than normal; but no sections of blood-vessels can be seen. In the neighborhood of the optic foramen there are an enormous number of capillaries with particularly thick walls. In the centre of the nerve, near the optic foramen, cavities exist, which are limited by a wall in which the altered capillaries are found. These cavities are partly occupied by a clear grayish mass. This mass is composed of finely granular cells, with a pale protoplasm and a small nucleus which is poor in chromatin, but which in certain nuclei is arrayed in the form of karyokinetic figures. The alterations are primarily vascular. The inflammation of the capillaries appears, whilst the nervous tissue is exempt. When these vascular changes are at their height, when the proliferation of the vessels and the thickening of their walls becomes such that there is no place for the nerve fibres compressed between these vessels and the optic foramen, these nerve fibres disappear completely without leaving any trace. If the alteration of the capillaries is not too great the most of the nerve fibres persist, certain ones presenting atrophy. The lesions of the nerve fibres, then, are secondary and proportional to the degree of change in the capillaries. This confirms the opinion of authors who claim that the vascular lesion is the primary cause of neuritis. This vascular lesion consists in a cellular infiltration which dilates and fills the space between the endothelium and the perivascular sheath. At this stage this infiltration resembles the cellular infiltration pointed out by Raymond in the capillaries of the cerebral cortex of general paretics. One is able, even, to compare it to the cellular infiltration of the adventitia of the arterioles which one meets in medullary syphilis. This inflammation is clearly distinguished, however, from changes due to syphilis, in that it gives place ultimately to the formation of an abundant substance which distends the perivascular lymphatics and constitutes a wall of great thickness to the capillary. On the other hand, the capillaries of dogs intoxicated by male fern never present endarteritis. We note also the polymorphism of the mesodermic cells of new formation which are the agents of the anatomical change. In the beginning the nucleus of one of these cells is round or oval, and the protoplasm is scarcely visible. The nucleus in no wise recalls the large crenated nucleus of the leucocyte. Later, at the point where the vascular changes are started, the nervous tissue rapidly disappears, the newly-formed cells multiply, their protoplasm increases, and they form, in this manner, a cellular mass which fills up the space left by the nervous elements. This mass is deposited, by preference, behind the optic foramen, because the peripheral ends of the compressed fibres degenerate more rapidly than the central ends. Around the changed capillaries the newly-formed cells degenerate; their protoplasm becomes extremely

clear and presents vacuoles, their nuclei are nothing but vesicles and do not stain with carmine. Finally, in the centre of the nerve, these newly-formed cells have lost their protoplasm, and a nucleus without a nucleolus may be found in the centre of a cavity, denoting the position of the protoplasmic body.

Weigert's New Method of staining the Neuroglia. (Beiträge zur Kenntniss der normalen menschlichen Neuroglia, mit 13 Tafeln. Festschrift zum fünfzigjährigen Jubiläums des ärztlichen Vereins zu Frankfurt a. M. Erscheint gleichzeitig als Heft ii., vom Bd. xix., der "Abhandlungen, herausgegeben von der Senckenbergischen naturforschenden Gesellschaft." Commissionsverlag von Moritz Diesterweg. Abstracted by Professor C. v. Kahlden, in *Centralblatt für allg. Path. u. path. A.*, Nos. 20 and 23, 1895. Translated by Dr. W. G. Spiller.)

Weigert remarks, in Section X. of his publication, where the technique is contained, that a method for coloring the neuroglia should answer the following requirements:

1. The stain must be elective,—that is to say, nothing should be colored which could be confused with neuroglia-fibres or interfere with their prominence. All methods must be discarded in which the staining of the axis-cylinder and the dentritic processes may not with certainty be avoided. All methods which color the body of the Deiters' cells in the same tint as the neuroglia-fibres,—that is, all methods in which the fibres appear as true processes of these cells may not be employed for the topographical study of the neuroglia. Weigert says, the fact that the connective tissue is also colored is not so important, as the structure of the neuroglia and of the connective tissue is so different that confusion is hardly to be feared.

2. The method must be sure,—*i.e.*, every properly-prepared preparation should show in every part every single neuroglia-fibre present. In regard to this point Weigert remarks, "In the full sense of the word, I have not been able to fulfil this requirement, in spite of many years' endeavor. In the interior of the preparations spots appear where neuroglia should be present; however, the method is quite certain."

3. It is very desirable that in a neurogliar stain other elements should be made recognizable, at least as far as is necessary for orientation. It is especially necessary in pathological processes that the nuclei should show, and it does not matter if these are colored in the same tint as the neuroglia. On the other hand, the nervous elements should be stained in a contrasting color.

4. The fibres must not be colored too faintly. Although in the original attempts made by Weigert the fibres were stained so faintly that they could scarcely be recognized as such under feeble magnifying power, now a more distinct tint has been obtained.

5. The preparatory hardening must, if possible, not last too long a time. The new neurogliar method from Weigert answers this requirement.

6. The preparations must not shrink or become friable in the hardening fluid. This requirement has also been met by Weigert.

7. A final condition, that the preparations should be permanent, has not been positively fulfilled, but sufficiently so.

The method is as follows:

I. Fixing and mordanting in a solution prepared by heating:

Chrome-alum, 2.5 parts;
Water, 100 parts.

To this hot solution, without further heating, add

Ordinary acetic acid, 5 parts;
Finely powdered neutral acetate of copper, 5 parts.
Stir well. After cooling, add ten per cent. of formol.

Small pieces of tissue, which are not longer than one-half centimetre, should be allowed to remain in this solution at least eight days. A longer time does no harm. After this they should be washed with water and alcohol, and placed in celloidin. If it is desired to stain also according to other methods, it is necessary to fix and mordant separately, and the small pieces not over one-half centimetre thick should be placed in a ten-per-cent. solution of formol, and afterwards in the mordant above described, without the addition of formol.

II. *Reduction.*—The sections are then placed for about ten minutes in a one-third-per-cent. solution of permanganate of potassium, washed with water after careful removal of this solution, and then placed for two to four hours in a filtered reducing solution, made as follows:

Chromogen, 5 per cent.;
Formic acid, 5 per cent.;
Water, 100 per cent.

To every ninety cubic centimetres of this solution ten cubic centimetres of a ten-per-cent. solution of sodium sulphate should be added before the solution is employed. In this solution, after ten minutes, the sections made brown by the permanganate of potassium are decolorized. The chromogen can be had from dealers in rare chemicals.

III. *Staining.*—Weigert's well-known fibrin-stain is used for this purpose, with certain modifications.

1. Methyl-violet is used as color. It is not employed in aqueous solution, but in an alcoholic solution (seventy to eighty per cent. alcohol), saturated while hot, and poured off from the sediment after having been allowed to cool. To every one hundred cubic centimetres of this solution five cubic centimetres of a five-per-cent. aqueous solution of oxalic acid should be added.

2. The solution of iodine and iodide of potassium is the same as in the fibrin method,—a saturated solution of iodine in a five-per-cent. solution of iodide of potassium.

3. The mixture of anilin oil and xylol should not be applied in the proportion of two parts anilin oil to one part of xylol, but equal parts by bulk of both should be taken.

The staining, as well as all other steps, should be done on the slide. The sections must lie smooth on the slide. They usually adhere well to a slide previously rubbed off with alcohol, when they are placed in a large vessel filled with water, and caught up by the slide placed under them.

The coloring is almost instantaneous. It does no harm, but likewise it is of no advantage, to leave the staining solution any length of time on the section. The mixture of anilin oil and xylol must be very carefully washed off several times with pure xylol before the balsam is placed upon the section, otherwise the preparations are not durable. In this respect neuroglia is more sensitive than fibrin. Preparations are more durable if they are not at once placed in darkness, but are allowed to lie exposed to diffuse daylight for two to five days.

Up to the present time the neurogliar stain can only be well applied on the human central nervous system. It is not yet to be recommended for that of animals. Rabbits' brains, at least, show the neuroglia only imperfectly,—not electively stained. The cause of this has not yet been ascertained.

When the method has been applied in this manner the neuroglia-fibres are stained faintly; the connective tissue is colorless. Ordinarily, the absence of color in the connective tissue is not important. It is better to place the sections, after pouring off the reducing fluid and after washing twice with water, in a simple (not acidulated) saturated 5-per-cent. aqueous solution of chromogen, and to leave the sections overnight in this carefully filtered solution. They should then be again washed with water and stained. In this way the collagenous tissue is stained blue with a violet tint; and the neuroglia-fibres are much darker, so that even the finest are visible; and, what is also of great advantage, the ganglion-cells, the ependymal cells, and the larger axis-cylinders assume a yellowish tinge.

If it is not possible to color the sections immediately after reduction, they should be placed in

80 per cent. alcohol, 90 cubic centimetres;
5 per cent. oxalic acid solution, 10 cubic centimetres.

If placed in water or pure alcohol, the sections soon become incapable of being stained.

As Weigert has already in part stated, a staining method quite similar in principle may be used for many other tissue elements; for the bile capillaries, the cuticular substances in the kidney epithelium, and other epithelial cells, as well as splenic structures, the double-refracting substance of the transversely striated muscular fibres, etc. Concerning these points, the author purposes further communications.

However, there are two important statements made by Weigert which concern the fibrin stain and the myelin stain.

The fibrin stain may also be used on sections from chromic acid preparations if they have been allowed to lie a certain time, better still some hours, in a five-per-cent. oxalic acid solution.

The hardening and mordanting necessary for the myelin stain can be shortened to four or five days, if the following solution is employed:

Bichromate of potassium, 5;
Chrome-alum, 2;
Dissolve by heating in water, 100.

If a sediment forms on cooling, the solution should be filtered or poured off. Only small pieces should be placed in this solution. Larger pieces may first be hardened in formol, and afterwards smaller pieces may be cut from these for the above-mentioned solution. The mordanting must be completed in four or five days. If the pieces are allowed to remain a longer time in the solution of chrome-alum and bichromate, they become friable.

The above-mentioned neurogliar mordant may also be applied, and if this has been done sections do not require to be placed later in copper.

In the first nine sections of the work, after an historical review, he discusses the relation of neurogliar fibres to the cells, the neurogliar nature of the fibres stained by the new method, their relation to connective tissue, the histogenesis of the neuroglia, its histological peculiarities, and its general and special topography.

Weigert defines the limitations of the method in the following words: "The method is not adapted to tracing embryological development of the neuroglia very far. Along with the staining of the nuclei of the neuroglia-cells, the method stains only those fibres which, as we will see, are differentiated in a peculiar manner. If, therefore, associated tissue exists in the central nervous system, as theoretically cannot be disputed, which does not contain such differentiated fibres, it fails entirely to be observed by application of the method." These deficiencies are for the pathological anatomist of very little importance. The nuclei of all the cells—the red blood-corpuscles in the vessels—are stained, as well as the neuroglia-fibres. The cell-bodies of the larger ganglion-cells are stained yellow, the larger cell processes and the axis-cylinders are likewise given a yellowish tinge, the finer processes are invisible. The cell-bodies of the smaller ganglion-cells are stained faintly or not at all, the bodies of those cells which are considered neuroglia-cells are likewise unstained,—therefore invisible. The gradual disappearance of the neuroglia-fibres within the invisible protoplasm is not to be observed. Neuroglia-fibres which have previously been considered as processes of Dieters' cells are therefore not chemically identical with their protoplasm, but are very different from this chemically. This chemical distinction does not appear gradually, in the so-called processes, at a greater or lesser distance from the cell-body, but the difference exists at

once, even in the immediate neighborhood of the cell-nucleus. Most of the so-called processes are no processes at all, as two of these may form a common filament passing across the cell, and not interrupted by the cell-body, as must be the case if they were processes, each one then having its origin in the cell-body.

Although Frommann, and later Golgi, and nearly all recent writers, following in their footsteps, have said that the neuroglia consists only of cells and their processes, this is true in man only in the embryological period. In full development the neuroglia consists of cells and fibres of which the latter predominate so greatly that they must be considered as the essential elements.

These fibres can therefore certainly not be considered as nervous intercellular tissue.

1. Because in the new method all that is nervous tissue remains uncolored; the fibres, however, are tinged dark blue.

2. Because the fibres consist of a modified non-protoplasmic substance, distinct from the cell-body.

3. Because the fibres (and the appertaining cells) behave pathologically exactly as connective tissue,—that is, they proliferate when the specific nervous tissue has been destroyed. Nothing positive can be said concerning the nature of the fibres as yet. Of the negative results the most important is that they are totally different from all fibres of ordinary connective tissue. Pathologically, connective tissue is never formed from neuroglia, or *vice versa.*

As already mentioned, the method of Weigert is not adapted to embryological investigation, as in the early embryological development no distinct fibres exist. In regard to histogenesis Weigert emphasizes the fact that in his preparations the neuroglia-fibres morphologically and chemically are uniform, and that it cannot be assumed, as is done by many, that one portion of the fibres originates in the mesoderm, another in the ectoderm. As an ectodermic origin has been demonstrated by different methods, it is necessary to assume "an uniform ectodermic origin of Dieters' cells,—that is, of the neuroglia in our sense." If the theory of an epithelial origin of the neuroglia, which has the type of connective tissue, sounds somewhat paradoxical, "one must not be astonished at what appears paradoxical in these relations, as the epithelium of the medullary plate possesses peculiarities very paradoxical to the nature of all other epithelium." In this connection Weigert refers to the penetration of the epithelium by interstitial fibres in later life, and to the origin of the nerve-cells from epithelial cells, which in their form and physiological characteristics differ completely from other epithelial derivatives.

Of the other histological peculiarities of the neurogliar fibres it may be mentioned that their course is straight, or nearly so, or notably curved. They are never sinuous, such sinuosities occur rather from contraction of the preparation. The fibres are solid, at no part do they show a tubular for-

mation. They are very regular and appear granular only when the spinal cord has not been placed sufficiently fresh in the fixing fluid. They do not possess moss-like or other processes, nor do they ever show those conical or flask-like enlargements such as are pictured repeatedly in Golgi preparations. The fibres are of different thicknesses, from the very finest to those 1.5 micro-millimetres thick. The very thick fibres occur only under pathological conditions, for example, in the cerebral cortex in general paralysis. Weigert has not observed division or anastomosis of the neuroglia-fibres.

Weigert makes the following statements concerning the general topography of the neuroglia-fibres:

1. A thick layer of very closely woven neuroglia-fibres is always found under the epithelium of the ventricles and of the central canal. This reticulum is the densest which occurs normally in the central nervous system. The choroid plexus, likewise lined with ventricular epithelium, offers an apparent exception; this contains neuroglia only where it is combined with nervous tissue.

2. In general, though not entirely without exception, the external surfaces of the central nervous system possess likewise a thickening of the neuroglia.

3. The same is true in those parts where formerly an internal or external surface was present, but which has disappeared in the process of development, for example, in the cornu ammonis.

4. The interior of those portions of the nervous tissue where superficial-like boundaries are to be found, are characterized by an increase of neuroglia-fibres. Such places occur, for example,—

(*a*) When the nerve-fibres of the white matter form dissociated bundles.

(*b*) About the ganglion-cells, where neurogliar reticula ("Neurogliakörbe") may be seen.

(*c*) At the borders of the perivascular spaces. The neurogliar masses may be very prominent here, even more so than on the external surface. The neuroglia-fibres are here chiefly parallel to the axis of the vessel. A spiral and a radiating course occurs also, the latter especially in general paralysis.

5. Concerning the general topographical relations of the white matter the general rule may be made that nearly every medullated nerve-fibre is separated from those about it by a neurogliar reticulum. This law, however, applies only to the white matter proper; where gray matter occurs between the individual medullated fibrils, intervening neuroglia may be, but need not be, present.

6. General rules cannot be made for the gray matter.

7. Not even the slightest connection can be demonstrated between neuroglia-fibres and nervous structures.

The special topography of the neuroglia—treated of in the following chapter—must be left to the original report, as the many interesting details would far exceed the limits of an abstract.

Regarding the physiological qualities the following points may be mentioned:

It is positive that the neuroglia has a space-filling function. "This is shown especially by pathological histology, for wherever space is made by destruction of nervous tissue the neuroglia proliferates and fills the area thus left free. Greater or smaller quantities of neuroglia-fibres fill the spaces left free by degeneration, whether this destruction involves the myelin sheath alone, as is said to be the case in disseminated sclerosis, or the entire nerve-fibres, as in tabes and secondary degeneration, or whether entire nerve-cells are destroyed, as in anterior poliomyelitis, or only portions of the same, as in progressive paralysis, or whether the entire nervous structure (cells and fibres) is destroyed, as in ischæmic necrosis. I would emphasize especially, although contrary to a former view expressed by me, that the dense cicatricial tissue following ischæmic necrosis does not contain connective tissue, as is easily demonstrable by the new method, but consists of tightly woven large masses of neuroglia."

A nutritive function by union of the ganglion-cells with the processes of the neuroglia-cells does not exist, inasmuch as this imagined union does not take place. Likewise the theory that neuroglia-fibres as very small capillary serous vessels may conduct nourishment must be discarded, as the fibres are not hollow, as was formerly believed.

Weigert opposes the hypothesis that the neuroglia serves for the isolation of innervation for various reasons. Indeed, the chief assumption that the neuroglia of the white matter is more abundant than that of the gray, which is mentioned in support of this theory, is not at all correct. On the contrary, the great variation but still typical arrangement of the neuroglia in the different portions of the central nervous system, as well as the different quantities on the superficial surfaces, seem to indicate that "some sort of statical laws govern the different forms of reticula in a manner similar to that which has long been demonstrated for other connective tissues, as for the arrangement of the normal bone trabeculæ, by Culmann, Herman v. Meyer, among others; for the pathological conditions of bone, by Julius Wolff; for the fibres in the dolphin's fin;" or for the ramifications of the blood-vessels, by Wilhelm Roux, etc.